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Editor - Captain H. GARBETT, R.N. (Retired),

To whom all communications should be addressed.

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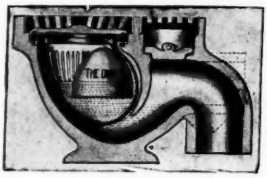

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Capt. C. Evans, R.F.A.
Capt. G. C. Merrick, D.S.O., R.G.A.
Capt. W. H. Moore, D.S.O., R.G.A.
Capt. J. P. Mackesy, R.E.
Capt. B. W. B. Bowdler, R.E.
Capt. F. D. Farquhar, D.S.O., Coldstream Gds.
*Capt. R. G. Parker, Royal Lancaster Regt.
Capt. G. N. T. Smyth-Osbourne, Devonshire R.
Capt. V. H. M. de la Fontaine, East Surrey R.
Capt. and Brev. Major F. R. Hicks, Hamps. R.
Capt. H. S. Williams, Dorsetshire Regt.
Capt. B. D. L. G. Anley, D.S.O., Essex Regt.
Capt. R. S. Hamilton-Grace, Durham L.I.
*Capt. H. F. Baillie, Seaforth Highlanders.
Capt. P. S. Allen, Gordon Highlanders.
Capt. J. K. Cochrane, Leinster Regt.
Capt. R. L. Ricketts, Indian Army.
Capt. W. K. Bourne, Indian Army.
Capt. F. W. Lumsden, Royal Marine Artillery.

And the following received nominations:—

Captain H. C. Bickford, 6th Dragoon Gds.
Captain C. J. C. Grant, Coldstream Gds.
Captain W. D. Wright, V.C., R.W. Surrey R
Captain C. H. Harington, D.S.O., Liverpool R.
Captain H. Wake, D.S.O., K.R.R. Corps.
Captain and Brev. Major N. J. G. Cameron, Cameron Highlanders.
Captain G. P. Grant, D.S.O., Indian Army.

SANDHURST, JUNE, 1906.

FIRST	...	A. G. Armstrong	...	5,541	129th	... R. P. T. Ffrench	... 3,827
48th	...	H. G. Gauntlet	...	4,515	181st	... C. W. Molony	... 3,445
67th	...	D. Macdonald	...	4,299	186th	... P. J. I. Synnott	... 3,386
89th	...	W. G. Bagot-Chester		4,115	190th	... R. M. Aylmer	... 3,339
90th	...	A. G. Ottley	...	4,109	197th	... O. Gough ...	... 3,262
93rd	...	A. P. Williams-Freeman		4,094	201st	... P. W. J. A. Stomm	3,151
115th	...	D. M. Black	...	3,940	213th	... B. W. Molony	... 2,881
125th	...	W. J. King-King	...	3,846			

WOOLWICH, JUNE, 1906.

31st ... ... J. S. Barkworth 6 483

DECEMBER, 1905.

SECOND	...	H. G. MacGeorge	...	7,196	16th	... R. Crofton ...	... 6,330
FOURTH	...	G. Walton ...	...	7,046	45th	... D. Stephenson	... 5,899
FIFTH	...	H. A. Cox ...	...	6,967	54th	... J. Kennedy ...	... 5,711

This was the First Examination under the new regulations, and our pupils secured THREE out of the first FIVE places.

MILITIA COMPETITIVE, MARCH, 1906.

A. E. Hardy	...	...	...	2,304	W. F. Anderson	...	... 1,947
N. H. Hutcheson	...	...	...	2,105	D. C. Robinson	...	... 1,879
*F. D. Frost	...	...	...	1,949	F. A. Bowring	...	... 1,876

* Read partly at the Army College, Aldershot.

ARMY QUALIFYING, 1906.

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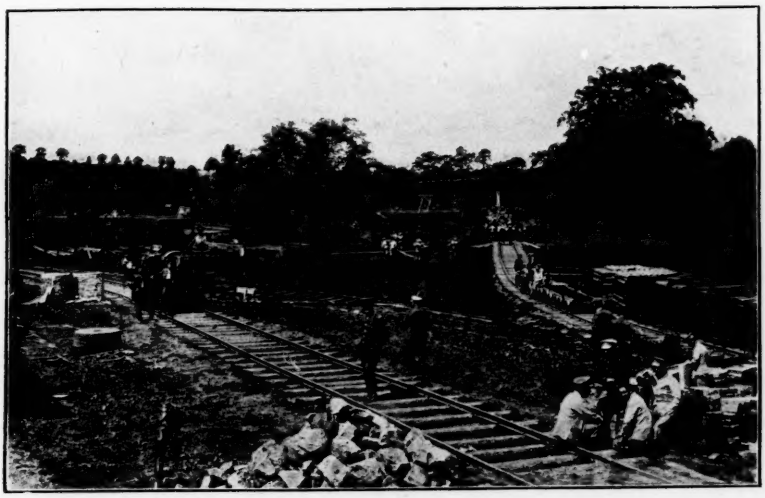
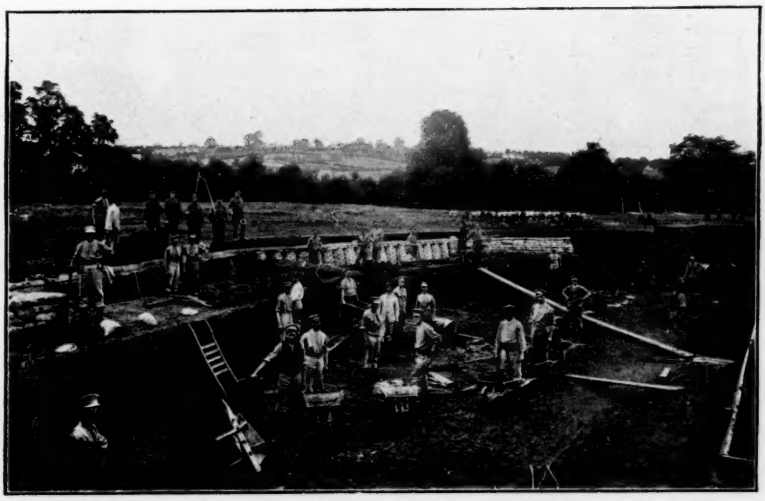


PWLHOLM, MONMOUTH, FIELD WORKS GROUND, ROYAL ENGINEERS (MILITIA).



HIGH COMMAND REDOUBT IN COURSE OF CONSTRUCTION BY RELIEFS OF THE BRIDGING COMPANIES, R.M.R.E. (MILITIA).

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THE JOURNAL
OF THE
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VOL. LI. SEPTEMBER, 1907. No. 355.

[*Authors alone are responsible for the contents of their respective Papers*].

SECRETARY'S NOTES.

1. OFFICER JOINED.

Lieutenant E. V. D. Birchall, 1st Bucks V.R.C.

ADDITIONS TO MUSEUM.

a. The Figure-head (representing King George III.), Coat of Arms, and six carved figures from the stern of His Majesty's Royal Yacht "Royal George."

The "Royal George" was laid down at Deptford in May, 1814, from the designs of Sir Henry Peake, Surveyor of the Navy, and launched in July, 1817. Her dimensions were as follows:—Length between perpendiculars, 103 feet; length of keel for tonnage, 84 feet 4¼ inches; breadth, extreme, 26 feet 8 inches; breadth for tonnage, 26 feet 6 inches; depth in hold 11 feet 6 inches; burthen in tons, 330 tons.

The "Royal George" was built of wood and rigged as a ship, and was remarkable for her excellent sailing qualities. She was laid up in Portsmouth Harbour in charge of the Master, and was only fitted out when specially required for the Royal Service. The lieutenants, mates, assistant-surgeon, and crew were employed on board the "Pantaloon," attached to the Royal Yacht as a tender. The "Pantaloon" was employed in looking after fisheries, conveying mails, and in any other service that might be required.

In August, 1842, the "Royal George" arrived at Woolwich and conveyed Her Majesty Queen Victoria and His Royal Highness Prince Albert to the Forth. The yacht proceeded down the Thames in tow of the "Monkey," in which King George IV. crossed from Holyhead to Ireland in 1823. The escort consisted of Her Majesty's steam vessels "Shearwater," "Salamander," "Lightning," "Black Eagle," "Fearless," and "Rhadamanthus," and the Trinity House Yacht "Vestal." The "Trident" paddle-wheel steamer of 1,000 tons was hired to convey Her Majesty back to the Thames. The "Royal George," which had left the Forth at the same time as the "Trident," under sail, arrived at

Woolwich on the 22nd September, five days after the arrival of the "Trident"; she then returned to Portsmouth.

In 1843 the "Royal George" was paid off on the new Royal Yacht "Victoria and Albert" being commissioned. From 1843 to 1902 the "Royal George" was used as a hulk in which the officers and crew of the "Victoria and Albert" were accommodated when the latter was not required for service. On the 9th September, 1905, His Majesty gave instructions for the "Royal George" to be broken up.

Given by His Majesty the King.

b. Officer's Belt Buckle of the 17th Regiment, worn prior to 1881.

Given by Lieut.-Colonel E. A. H. Webb, late 17th Regiment.

c. A Pewter Tankard which was in the possession of the late Colonel E. A. H. Webb, C.S.I., Madras Army, during the period of his captivity as a hostage at Cabul in the Afghan War of 1841-2, when he (then a subaltern), with five other officers, volunteered for the most dangerous service. 266 notches engraved on the tankard represent days of imprisonment. The officers were eventually released by General Pollock's Army on September 19th, 1842.

Given by Lieut.-Colonel E. A. H. Webb.

d. A Sword taken from an Indian Chief by the late Colonel E. A. H. Webb, C.S.I., during the first Afghan War of 1841-2; it has since been converted to the pattern of a British General Officer's Sword, the blade is of Damascus manufacture.

Given by Lieut.-Colonel E. A. H. Webb.

3. MILITARY HISTORY LECTURES.

Arrangements are being made for the usual course of Lectures on this subject for officers entering the November Examination. Full details will be published in the Service Papers in due course, or may be obtained from the Secretary on application.

4. GOLD MEDAL ESSAYS.

The following Essays have up to the present been received from candidates for the 1907 Gold Medal:

"La Critique est facile, L'Art est difficile."

"Auri sacra fames."

Candidates are reminded that all Essays must be received on or before November 14th, 1907.

5. WINTER ESSAYS.—The attention of Officers is drawn to the new JOURNAL index lately printed. Contained in it are references to almost every possible subject for these essays; the back numbers of the JOURNAL in which the papers appear can always be obtained at the Institution. The price of the Index is 1s.

THE MILITARY SYSTEM OF THE FUTURE IN THE BRITISH EMPIRE.

Communicated by desire of the Secretary of State for War.

I.

THE Territorial and Reserve Forces Bill having become the law of the land, the situation likely to arise when its provisions are enforced demands careful consideration and examination. One thing must be clearly borne in mind: the Bill, in itself, alters nothing. It is, as Mr. Haldane has pointed out time after time in the House of Commons, an enabling Bill, and its passage through both Houses of Parliament only places the Army Council in a position to create forces which otherwise could not have been called into being.

This aspect of the Bill is well brought out in an able article dealing with the English military system, which appeared in the *Revue Militaire* for June. The member of the French General Staff who writes the article summarises his conclusions on the new scheme as follows:—

> "Its complete realization, especially as far as the Territorial Army is concerned, will require much time, much work, effort and perseverance: ultimate success will depend on the nation alone. If the nation accepts with courage the duties which are laid on it and consents to submit with goodwill to the new obligations which are demanded, the work of the Secretary of State will live; otherwise, it is destined to fall away and will have no efficacy."

These remarks are perfectly true. The work of reorganisation will necessarily require years to take effect, and the Army Council and the new Associations will have to work with a will to achieve success.

But before the objects which must be kept consistently in view are enumerated, it is as well that the existing state of affairs, or rather the arrangements of a few years since, should be passed in review, as otherwise the need of remedial measures will not be easily understood. And in making such a review, the organisation of the Auxiliary Forces cannot be considered altogether apart from that of the Regular Army. All the forces together must form one organic whole, and if real progress is to be made, greater emphasis must needs be laid on this fact in the future than has been customary in the past.

The improvements which have been made in the organisation of the Regular Forces during the last three or four years, only serve to bring more strongly into relief the unsatisfactory condition of the Militia, the Yeomanry, and the Volunteers. Not so very long since the need of really scientific organisation for war was not realised, or, at any rate, such organisation was not applied, even in the case of the Regular Army. So late as 1905, one distinguished General, a pluralist in spite of himself, commanded both a Division and a Brigade of the Regular Army; was Governor of one of our most important fortresses and responsible for its defence scheme; administered, and, theoretically, was responsible to Parliament for the expenditure of every penny spent in a large district comprising many counties; and with no Divisional Generals or Brigadiers as intermediaries, commanded a mass of units of all arms of the Auxiliary Forces.

In the opening stages of the South African War nothing was more clearly demonstrated than this, that the organisation of the Army in 1899 was not adapted to meet the exigencies of a campaign of any considerable magnitude. Divisions and Brigades, even Army Corps, existed, it is true, on paper, but with the exception of one Cavalry Brigade and an Infantry Brigade at Aldershot, which took the field as they stood, every formation higher than the unit had to be improvised when mobilisation was ordered. The powers of Divisional and Brigade Commanders had never been defined by regulation, and had to be settled as occasion arose. The use of more than one line of communication had not been contemplated in the manuals dealing with the supply of an Army in the field; and the relations between the commanders of troops and the administrative authorities were so ambiguous that it was hard to say where responsibility in financial matters lay, with results that were made evident in the proceedings of Mr. Justice Farwell's Commission. Most important of all, extreme centralisation in peace in all matters pertaining to the expenditure of money had produced a system which was utterly unworkable under war conditions. In the words of the Esher Committee's report, "While the present system of financial control is futile in peace, it is ruinous in war. Officers unaccustomed to bear any financial responsibility, and ruled by excessively complex regulations, cannot at once improvise a system for the control of expenditure in the field, when the restraints are suddenly removed. The result, as in South Africa, is the waste of millions."

Since the reforms that have been made in consequence of the recommendations of the Esher Committee, the state of affairs which obtained in 1899 may now be said to belong largely to a period when we possessed, what the French General Staff, in the article already referred to, euphemistically describes as "une organisation trop archaïque, trop formaliste."

The whole tendency of modern methods is to define accurately the work which each individual in the military hierarchy will have to perform in war; to carefully select the individual on account of his possessing qualifications fitting him for the work in hand; and then, by a thorough system of inspection, to ensure that the work is properly carried out. In other words, the object should be to settle, first of all, a suitable war system, and then make the peace system conform.

A glance at the Monthly Army List will show how far the methods just alluded to have already been applied by the Army

Council in the case of the Regular Army. Under the General Officers Commanding-in-Chief we find Divisional Generals, Brigadiers of Cavalry and Infantry, Coast Defence Commanders, and Administrative Generals, all performing in peace the duties which, in war, they would have to carry on, either in the field or on the lines of communication. But an indiscriminate assortment of units of the Auxiliary Forces still remains under the various Grouped Regimental District Commanders as a relic of less scientific methods, and the most intelligent enquirer would find it difficult to realise how our Auxiliary Forces were to be employed in war, and what is the nature of their war organisation. Their numbers and organisation are based on no scientific standard, and the various units have been raised on no more enduring basis than the preference of the inhabitants of any particular neighbourhood for artillery, or infantry, or engineer duties, according to their fancy.

An initial difficulty in determining what their proper organisation should be arose from the fact that agreement as to the *rôle* which these forces were to perform in time of war was most difficult to obtain. It was, for instance, quite evident what Mr. Cardwell, in drawing up his scheme of organisation, intended that the Militia should do in time of national emergency.

The grave lessons of the Crimean War were summarised in the report of the Localisation Committee, which, in 1872, laid the foundations of the existing military system. Of these lessons the chief is contained in the following sentences taken from the report:—"The completion of the expeditionary battalions to war strength forms the smallest part of the task imposed on the Administrators of the Army. These battalions must afterwards be maintained in the field in undiminished numbers and efficiency. For the supply of war casualties the men of the Militia Reserve would form a valuable element. A Militiaman, after having passed through one yearly training and six months embodiment in addition thereto, might be depended on to fight side by side with the more veteran soldiers of the Field Army. The objection has been urged that Militia battalions would be deteriorated by the transfer of their best men to the Regular Army in the field, but the question for consideration is not what is best for the efficiency of this or that service taken alone, but what is best for the military interests of the nation; and whether it is preferable to send raw recruits from the plough to fill up gaps in the ranks of an army in the field, or to pass those raw recruits through the Militia mill first, and to take for the supply of war casualties Militiamen who would have acquired some notions of drill and discipline."

Again, in the same report, it was laid down as an axiom that the Regular battalions abroad and at the theatre of war "would depend for the supply of their casualties on the two embodied Militia battalions of their Brigade district, and below them on the Depôt, recruits being passed from the Depôt as soon as drilled into the Militia battalions of the district; and reinforcements for the Army in the field, consisting of the best drilled soldiers of the Militia battalions, being obtained from these battalions by volunteering, or transfer, as the case might be."

As to the wisdom of the policy of thus reinforcing the veteran units in the field, by means of individuals rather than with new units, there can be no two opinions. General Sherman's well-known remarks on this subject cannot be too often repeated: "The greatest mistake,"

he says, "made in our Civil War was in the mode of recruitment and promotion. When a regiment became reduced by the necessary wear and tear of service, instead of being filled up at the bottom, and the vacancies among the officers filled from the best non-commissioned officers and men, the habit was to raise new regiments, with new colonels, captains, and men, leaving the old and experienced battalions to dwindle away into mere skeleton organisations." . . . "I remember that Wisconsin kept her regiments filled with recruits, whereas other States generally filled their quotas by new regiments, and the result was that we estimated a Wisconsin regiment equal to an ordinary brigade. I believe that five hundred new men added to an old and experienced regiment were more valuable than a thousand men in the form of a new regiment, for the former, by association with good, experienced captains, lieutenants, and non-commissioned officers, soon became veterans, whereas the latter were generally unavailable for a year."

The military situation as it now exists, requires most careful consideration in the light of these remarks.

At the commencement of the South African War in 1899, we possessed a Militia Reserve consisting of nearly 30,000 Militiamen, who were individually under contract to join the Regular Army in time of emergency. At the present time no such reserve exists, and it is impossible to say how, in a serious war, wastage would be made good, not in the infantry alone, but in the artillery and in the departmental services as well.

Projects, it is true, have been formed during recent years for producing a large and sufficient reserve on a purely regular basis, and in consequence of these projects, Militia Commanding Officers had not unnaturally come to the conclusion that they were to be relieved of the unwelcome *rôle* of draft-finding in time of war which had been assigned to them by Mr. Cardwell. It had become their ambition that their units intact should form the nucleus of that army of expansion which the Elgin Commission had indicated as being essential for national safety. Unfortunately, the projects which were to make the Regular Army self-supporting and so give the Militia a more independent position all proved abortive. The dilemma created in consequence is demonstrated by the discussions between certain War Office representatives and a number of Militia Commanding Officers which took place in July, 1906, and which were published a year later in a paper (Cd. 3513), by command of His Majesty. The Army Council had been driven by the logic of facts to revert to the system inaugurated by Mr. Cardwell, and was compelled therefore to ask the Militia, once more, to assume that responsibility of finding drafts for the Regular Army in time of war, which had formed the very basis of the Cardwell system. "We think it advisable to point out," so runs the paper referred to, "that the difference between the views of the Army Council and of the Militia Officers is fundamental, and that while the latter desire that the Militia Infantry should be used only in battalion units for the purpose of expansion in time of war, the former, while not altogether precluding the use of the Militia in battalion units, desire to have the power of using them as an Army Reserve for the purpose of finding drafts, should circumstances require it, to make good the wastage of war in the regular battalions of the Line."

But the experience of the South African War had shown that it is not numbers alone that are required for making good wastage in war.

Some well-understood and well-adapted machinery is also needed for training and maturing the drafts, which are later to be sent to the army in the field. The history of military administration in the United Kingdom during 1900 and 1901 was concerned constantly with the improvisation of machinery for this purpose. In this connection the difference between our own circumstances and those of Continental Powers must be borne in mind. For a nation whose system is based on compulsion, the problem of draft-finding in war is of the simplest kind. As many half-trained, or even untrained, men as are required are called up to a training Depôt from time to time. Their ages are well known. They are all, say, 20 or 21 years of age, and at the end of two, three, or four months, as the case may be, they will be classified as trained soldiers, and be sent to join their units in the field. But with us the case is very different. We must take the recruit when he is 18, or rather when he says he is 18, and comes up to the physical standard of that age, as otherwise we may not get him at all, and as he cannot go to the front until he is 20, we must find a home for him in the United Kingdom for the next eighteen months or two years. Training units are therefore of primary importance, both in peace and in war, where the young soldier can mature and be properly disciplined pending the time when he can be sent to a unit serving abroad. The want of adequate machinery to replace the units of Cavalry, Artillery and Infantry serving in the United Kingdom, which in peace fulfilled the *rôle* of draft training, when in 1899 these were mobilised and sent to South Africa, was a serious defect in our organisation, and in the case of an even greater trial of our military strength the omission to provide such machinery might have been fraught with disastrous results. A few instances only need be quoted to show how serious was the state of affairs thus created.

On the departure of the Field Force for South Africa, at the end of 1899, the following was the procedure, it can hardly be called a system, of organising the residue at home.

Each Cavalry Regiment formed its surplus of immature men, and men who were passed medically unfit, etc., into a Reserve Squadron. A small establishment was allowed for the cadre of this Reserve Squadron in peace time, but when war broke out, this proved quite inadequate for the provision of the additional officers and non-commissioned officers who were required to cope with the extra duties which a state of war entailed. Meanwhile cavalry recruiting was kept very brisk in order to provide the requisite drafts for the units in South Africa. The result was that in a very short time the number of privates in the Reserve Squadrons became hopelessly out of proportion to the number of officers and non-commissioned officers. Officers were hastily summoned from the Reserve, a few Yeomanry officers were found who were willing to assist, and the more promising recruits were promoted, before they had even been dismissed recruits' drill, and so, thanks to the ceaseless efforts of all concerned, some sort of organisation was in time improvised, though, in some cases, officers had to control six or even eight times the number of men that normally constitutes an officer's command.

The Reserve Squadrons were in no sense tactical units; they existed merely to train drafts and to deal with *personnel* returning from the seat of war. Later, when the United Kingdom had been denuded of all Regular cavalry regiments, the reserve squadrons were,

as a make-shift, hastily grouped into provisional regiments, and tactical functions were supposed to be added to their hitherto purely administrative duties. But, in spite of most determined and self-sacrificing efforts on the part of those who were called on to bring these hastily formed units into a state of efficiency, nothing was more clearly demonstrated than that the very nature of the functions for which they existed administratively, precluded their ever reaching an even moderate standard of tactical fitness.

In the Royal Artillery, the proportion of those left behind to those who proceeded to South Africa was far less than in the other arms. The residue of each battery sent to the front was absorbed into batteries which remained behind, and no special organisation therefore was necessary. Later, the proportion of the artillery arm at home was increased by the formation of a considerable number of regular batteries, and of some new Depôts, and, although at the time that these were formed there was a considerable shortage of artillery-men, and drafts to South Africa had to be cut down to the lowest proportion, the new batteries soon filled, and there was in consequence no urgent necessity for emergency measures in this arm. Moreover, casualties in the artillery were fewer than in the other arms, and long before the war was over the Boers had no artillery left, and so our own artillery requirements in South Africa gradually diminished.

The Infantry went through more vicissitudes than either of the other arms. In the first place a Militia battalion from the same territorial corps was called out to take the place of every unit which went out with the field force, or as a reinforcement. Into these Militia battalions were incorporated the "details," as they were called, which were left behind by the Regular battalions. Here again the peace establishment allowed no margin of officers and non-commissioned officers, and, as in the cavalry, these had to be improvised as best they could. This organisation did not prove satisfactory. Friction arose between the Militia portion of these units and the attached details, and had these mixed units been tactically employed, their heterogeneous nature would certainly have made itself seriously felt. Moreover, in course of time it became apparent that the Militia could not be indefinitely embodied for home service, and unit after unit was disembodied. It became, therefore, necessary to improvise some fresh organisation. The Royal Reserve regiments, which had been formed, had ceased to exist, and so it became necessary to copy the system already accepted in the cavalry, and group the various "details" into provisional battalions.

The same objections which have been recorded against the provisional regiments of cavalry applied with equal force to the provisional battalions of infantry. They were mere emergency organisations hurriedly raised to meet the needs of the moment, and that they had to be formed at all was due to no proper system having been thought out and prepared during the years of peace. As in the cavalry so in the infantry, the number of officers in each battalion was totally inadequate to cope with the large number of men, and the only wonder is that they managed to get their work done as well as they did.

The experience gained in the years 1899-1902 proved conclusively to those on whom fell the task of administering the disorganised mass of troops remaining in the United Kingdom, that one of the first measures of reform required was the inauguration of a proper system by which the home organisation of all arms and services would be carried on without hitch and without loss of continuity, on the departure from these shores of the Expeditionary Force.

The conversion into "training brigades" of the artillery brigades surplus to the requirements of the Expeditionary Force, and the constitution under Part III. of the new Act of a third or reserve battalion for every pair of Regular battalions, must be regarded as an instalment of the necessary measures of reorganisation. What it is now proposed to do for the artillery and infantry will in time be extended to other branches of the Army, so that, in the event of the whole Expeditionary Force being sent abroad, all arrangements at home for maintaining it in the field shall have been carefully thought out beforehand. The improvised methods of the South African War must not be repeated. Not only must the officers and men who are to compose the requisite drafts be forthcoming, but also all details connected with their accommodation, their administration and their training will, it may be hoped, before the next trial of strength occurs, have been carefully elaborated as an integral part of the general scheme of mobilisation.

Reference also must be made to the inconvenience and confusion which resulted in certain instances, during the war, from over-centralization in matters relating to corps or regimental administration. In peace, doubtless many good arguments could be adduced in favour of a system which brought a multitude of questions concerning individual non-commissioned officers and men to one central department. But under the stress of a great war, such a system was bound to prove too cumbrous, and in the cavalry and infantry especially the need for decentralisation was keenly felt. In corps like the Royal Engineers, the Army Service Corps, and the Royal Army Medical Corps, which, under departmental supervision, possessed well-organised record offices of their own, and in the regimental orderly-rooms of the Guards, personal questions were throughout the war disposed of rapidly, without reference to Army Headquarters. The organisation of record offices for all arms and services and the appointment of senior officers to be in charge of regimental records, in accordance with the recommendations of the Esher Committee, are measures which have already gone far to produce much needed uniformity, on decentralised lines, in all matters pertaining to regimental administration.

Enough has been written to show how great is the task which yet requires to be accomplished, before the administrative deficiencies in the Regular Army alone which were brought to light during the South African War can be regarded as being fully remedied. Incidentally, too, the necessity of completing the work begun by Mr. Cardwell and his fellow-workers has been demonstrated. The connection between the Line and the Militia initiated in 1872 will not be severed, but will become more intimate than before, all distinctions between the old first and second Lines being for all practical purposes abolished.

But the preparation for war of an Expeditionary Force and the measures necessary for its maintenance in the field are not the only, or even the most vital matters that must in future occupy the attention of those who are responsible for the administration of the Army. The powers of expansion beyond the limits of the professional forces of the Crown, which the Elgin Commission pronounced in no uncertain terms to be essential for the safety of this Empire, have yet to be provided. The extent and the nature of those powers the Commission did not, and could not, specify. The conditions of to-day may possibly be wholly different a few years hence. All that can be prescribed with

certainty is that the military forces throughout the Empire must in future be regarded more and more as one body; the same ideas of war organisation and war training must permeate the whole mass, such differences as continue to exist between the various constituent parts being differences not of kind, but merely in degree of readiness to take the field.

The future historian, it may be, will regard the resolution passed with acclamation at the recent Colonial Conference, recommending the creation of a truly Imperial General Staff, as one of the most momentous decisions of our time. When that resolution is carried into effect, as is actually happening, the term "The Imperial Army" should, and will, acquire an altogether novel significance; for this greater General Staff, freed from all responsibility for dealing with the details of peace administration either here or in India or elsewhere, must have as its objective the welding into an organic whole, for the purposes of war, of the scattered military forces which are maintained by the various States forming the Empire. In giving to the new Territorial Force an organisation similar to that of the Expeditionary Force, the Army Council is only setting an example which, it may be hoped, will be followed at no distant date by other military administrations throughout the Empire.

The object to be kept in view may perhaps be best explained by taking for illustration the analogy of an army at rest during a break in the operations of a campaign. Here the main body lies secure in widely scattered cantonments under shelter of outposts sufficiently strong to ward off sudden attacks. Assuming that the enemy is still at a distance, or that some obstacle difficult to pass intervenes, the main army can, figuratively speaking, lay its arms aside, safe in the knowledge that the outposts can, for a time at any rate, deal with any contingency likely to arise. None the less, the thought must be constantly present in the mind of the Commander-in-Chief that need for utilising the services of the main body may arise at any moment, and all measures for placing it under arms and for concentrating it towards any threatened point must be careully thought out beforehand. At any moment, too, circumstances such as the nearer approach of the enemy, or a weakening of the outposts, may render obviously inadequate those measures of preparation which have been regarded as sufficient hitherto. Two ways suggest themselves for meeting the new situation. Either the outposts may, if possible, be considerably strengthened, or, failing this, the main body must itself be kept constantly in a condition of greater readiness to take the field. A point even may ultimately be reached where no strengthening of the outposts will give the necessary sense of security. When two armies are in close contact and are actually facing one another on the field of battle, nothing then avails save that every part shall be held ever in readiness for immediate use. Each soldier rests, his rifle by his side, ready to take his place in the ranks the moment the order to fall in is given, and at the present day Continental nations may not inaptly be compared with armies so situated. But the nations of the British Empire are, fortunately, not called on in peace to bear this state of tension. For them, the Regular regiments and battalions, highly trained and highly disciplined, serving year in and year out on distant frontiers, represent the outpost squadrons and the outpost companies protecting an army in war, and behind these the Expeditionary Force, requiring but a comparatively short time for its mobilisation, forms the main

reserve of the outposts ready, either as a whole or in part, to reinforce the outpost companies if anywhere they are hard pressed.

But the defence of a great Empire is not likely to be for all time a mere affair of outposts. To properly organise and to adequately train the citizen forces of the Empire is without question the most serious problem which calls for solution. As to what their organisation should be there can be no two opinions, seeing that one pattern of organisation, and one only, is possible. If our military forces exist for war, the war organisation officially adopted after mature consideration by the General Staff must clearly determine the nature of all peace organisation.

What constitutes adequacy of training, however, is a question which admits of greater divergence of opinion. For instance, the training which may be held to be sufficient for the citizen forces in one part of the Empire may conceivably be quite inadequate in another portion, which, for some reason or other, is more open to attack. Again, the amount of training which suffices to-day may, ten or twenty years hence, have to be considerably increased owing to some change in the political or the military situation.

Whereas organisation is a fairly constant factor which should be determined for the Imperial Forces as a whole; the question of the amount of training, on the other hand, that those forces are to receive, is one which each part of the Empire and each generation, in its turn, must decide for itself, after all the circumstances of the place and the period have been carefully weighed and considered.

(To be continued.)

THE BLOT IN RECRUIT TRAINING.

By Lieut.-Colonel F. A. DAVY, M.D., late R.A.M.C.

On Wednesday, 30th January, 1907.

Surgeon-General Sir T. J. GALLWEY, K.C.M.G., C.B., M.D. (Principal Medical Officer, Aldershot Army Corps), in the Chair.

FROM this place, over 40 years ago, Professor Maclean, then of Netley, delivered an address at a meeting of the Royal United Service Institution, in which he called attention to the losses sustained by the Army, owing to invaliding for one class of diseases. He did so in the following words, which I quote because it is important to show, at the outset, that it has long been recognised that some undiscovered cause has been at work to account for these losses, and for the disability under which the Army labours in the matter of the physical inefficiency of so large a proportion of the men. He said:—"I had not been long in the position I have the honour to fill in the public service before I became profoundly impressed with the vast losses sustained by the prevalence in the Army of consumption and diseases of the circulatory system; that is, of the heart and great vessels. Within the last three years—excluding those who die in regimental and depôt hospitals, and those of the Household troops, and excluding also those invalided in Ireland, of whom we at Netley see nothing—no less than 1,344 men have been lost to the Service from consumption alone. . . . From the date of my assuming charge of the Medical Division at Fort Pitt, in April, 1861, to the end of last year, no less than 883 cases of disease of the circulatory system—a number equal to the strength of a battalion—have passed under my observation, and been lost to the Service from this one class of disease: the great bulk of the cases being young men returned to the civil population (that is, cast upon their parishes), and incapable of earning their bread at any active employment. The pension allowed to such short service men is but a pittance, and is granted only for a limited period. Let me remind you again that in the figures I have given, the invalids of the Royal Artillery, the Guards, and the troops serving in Ireland, are not included: *they* were discharged without being seen by us at all. Surely, gentlemen," he continued, "you will agree with me, after hearing a statement so startling, that it behoves us to look narrowly into a question involving such an amount of suffering, costly invaliding, and inefficiency, with a view to the adoption of a remedial measure."

Now, in those long-ago days it had not occurred to anybody that the setting-up drill might be to blame. Nor was suspicion likely to arise. For chest expansion—although it involved grievous interference with normal breathing—was deemed a good thing. It was meant, of course, to benefit the men; it was, therefore, thought it *must* benefit

them. As I have said, suspicion that a thing is evil is not likely to arise if it be done in the name of good. But the difficulty remained. Numbers of men who were carefully examined, and passed, and enlisted, as likely to become efficient soldiers, were found unfit after a few months, and discharged for palpitation of the heart, and breathlessness on slight exertion. Indeed, it would be little exaggeration to say that, when I was at Netley, in 1868, Professors Maclean and Parkes were wringing their hands over the waste of the Army, and a prize was instituted for the best essay on the causation of the trouble. A medical officer of the Guards, who wrote the prize essay, laid the blame on a variety of causes, but mainly on the tightness of the clothing and accoutrements of the men. This was accepted; for the other causes alleged would operate among civilians as among soldiers; and the expression "soldier's heart" would thus find a sort of explanation. But, when desirable changes were made in the clothing and accoutrements of the soldier, the waste of young men was practically undiminished, and enlarged, hypertrophied hearts, and palpitation, continued to occur in large proportion among men trained in a loose serge frock. Still, the chest-swelling—the strained attitude of the soldier at attention (involving, as it does, interference with natural breathing)—continued unsuspected, for the reason I have mentioned. I submitted a paper to the Army Medical Department in 1877, attributing the waste of the Army, in this regard, to the orders of the drill-sergeant—*alleging that in obedience to him mechanical obstruction and strain are imposed on organs (especially on the heart), the integrity of which it should be the object of all training to preserve.* That paper was published in the A.M. Blue Book for 1876, which was late in appearing.

I shall now have the honour of presenting to you a summary of the argument there given. But before doing so, I should like to say this: that while military officers quite allow that the losses by invaliding and desertion are very great—they have, indeed, been aptly likened to pouring water on a sieve—their contention is, that these losses are owing to the defective quality of the recruits rather than to any fault in the system of training them; that, if good men do not come forward in sufficient numbers, the medical examiners necessarily pass men who are defective, and who, therefore, break down. Suppose, for a moment, we grant all that. Is it not an argument in favour of a thoroughly scientific training—a training rigidly excluding anything that can be shown to be unscientific? There *should* not be anything in a military training that will not benefit even a defective man. But the system we have, if faithfully followed out, must prove injurious to the strongest men—those men who best obey the orders being those who suffer most. But great care is taken in the medical examination, and even after the preliminary weeding out by the recruiting-sergeants, who have a very good eye for the class of man who will pass the doctor, some 50 per cent. are rejected. The medical contention, therefore, is, that the breakdown of recruits and young soldiers is brought about by something wrong in the training. Proceeding, now, to the argument, I will only add that the writer of the prize essay alluded to, said in it, that he had "often seen recruits (in the Guards) perfectly exhausted after their morning's drill." But no explanation of this exhaustion was given. Training ought not to result in exhaustion. If it does it is bad training. It is training with a blot in it.

Let us now approach a body of recruits as they are being drilled, and examine one of them. The first thing to be noticed is, that there is the great elevation of the ribs of full inspiration, even the scaleni muscles being in action. There is also great depression of the diaphragm, and the sternum is thrown forward. Our eyes are just being attracted to the abnormal character of the heart's impulse, when we mark with surprise that this distended condition of the lungs does not give place to a properly-performed expiration; that little descent of the ribs occurs, or adequate elevation (that is to say, relaxation) of the diaphragm; in other words, that the act of expiration is, to a great extent, in abeyance. This, because the recruit knows that, discomfort notwithstanding, he must keep his chest expanded. Now, what consequences must certainly follow when this so-called training is persisted in day after day? I shall not speak of the heart just now. The consequences to it of this training are direct and immediate, as well as indirect. We know how inter-dependent the heart and lungs are; how influences affecting the heart soon affect the lungs, and *vice versâ*. But it must at once occur to the mind that not only will the forces by which the important act of expiration is to a large extent accomplished in health—the elastic recoil of the lungs and of the chest walls—be, by repetition of this training, gradually diminished in power, but that, as the man stands before you, the blood in his lungs must be undergoing a deficient aëration. For, as the diminution in size which takes place in the chest, when expiration is properly performed, does not occur, it must follow that the air in the lungs, charged with carbonic acid, is not expelled to the usual extent, to be replaced by new air from without. Now, in active exercise of any kind, it is of the last importance that expiration should be efficiently performed. Under these circumstances a greatly increased quantity of carbonic acid having to be got rid of by the lungs, the respired, or charged, air needs to be expelled by strong expiratory movements, and fresh air inspired. In other words, the elastic power of recoil of the lungs and of the chest walls needs to be unimpaired. In very few soldiers have I found it so. The drill which the man before us is undergoing cannot be described as active exercise, and that is the only reason why the position is tolerable at all. Further reasons, showing that the chemical functions of the lungs are impeded by the maintenance of this chest-expanded attitude will appear when the effect of it on the heart is being considered. Before proceeding to the latter, I must add that in the gradual weakening of the forces by which expiration is normally performed, the over-stretching to which the abdominal muscles are subjected by the training is a very important factor. In normal expiration the contraction of these muscles diminishes the cavity of the chest by pressing the abdominal viscera against the passive diaphragm, and so elevating it. In the artificial condition imposed by the attitude of the soldier they are not only weakened by over-stretching for this work, but their action is antagonised by the diaphragm being kept depressed.

I think it will be admitted from the foregoing account (which I might extend by a fuller review of the mechanism of normal respiration if time allowed) that the physiological conditions—under which the act of expiration is performed in health—are gravely altered by the artificial chest expansion ordered for the recruit. This alteration cannot take place with impunity. Pathological states commence when physiological conditions are departed from. As concerning the result

to the lungs, the word pathological may not be admitted by all. For myself, I am convinced that vesicular emphysema, to some extent, occurs in nearly all the men—during the period of this training—from the continued and excessive distension of the air vesicles. Hypertrophy of the elastic parenchyma of the lungs might be expected to occur on the "*ubi stimulus ibi fluxus*" principle; but, if it does, it will not be compensatory and tending to the restitution of expiratory power, but will cause pressure upon, stretching of, and partial obliteration of the functional blood vessels—the pulmonary capillaries. I conclude, then, that you may increase the measurement of the recruit's chest in this way, *but that you do so at the expense of its mobility, at the expense of vital capacity, and that the recruit is thereby more or less unfitted for active exertion*—one reason for which I have already given.

Sooner or later the drill becomes distressing to the obedient recruit. He is distressed but uncomplaining. It will be right now to inquire why it should so distress him. If good reason can be shown why it *must* distress him, and in some cases even "exhaust" him, it being always admitted that exhausting or even distressing drill cannot commend itself to any well-regulated mind, then I consider that a claim will have been established to have this injurious drill discontinued. We noticed when inspecting the recruit at his drill that the cardiac impulse was abnormal. We must now see more minutely what is taking place. We cannot hear his heart beat as we stand before him—I daresay he hears it himself, and feels it too—but we can learn a great deal by watching the cardiac region narrowly. The organ, as I said, suffers early; and even before the man thinks of complaining a pathological condition has commenced.

I propose, then, first to describe the abnormal manner in which the heart acts in the dilated chest; second, to give the causes of its abnormal behaviour; third, to state why both one and the other (that is, the effect and its causes combined) produce exhaustion, or distress, or discomfort, or a mere feeling of irksomeness, as the case may be. Lastly, to consider the pathological states of the organ which may be induced.

Now, I shall be excused undertaking for a few moments this task, in order that I may disclaim any intention of exaggerating the consequences of this "training." A cause loses much by being over-stated—more especially a cause like this, with tradition, prevalent mistaken notions of what "physique" means, military views, popular ideas, all against it. And I beg, gentlemen, that you will remember that the order for chest expansion is an order that is by no means equally obeyed. I press it, also, that pathological processes of great importance may proceed very quietly, and attract at first little attention on the part of the sufferer.

Let us say the average recruit—speaking of those who withstand it best—would describe his dilating drill as merely irksome, or he might call it discomfort; I do not think he would often call it distress, at least in the earlier days. Some find themselves much distressed. And these are they, gentlemen, who take the order most literally and who best obey it. Further, I would not be understood as saying that in a short time the men who suffer break down utterly, and become unfit for duty of any kind. This is the result to many of them; but I am sure that in the great majority of heart complaints invalided—other than those brought about by rheumatism, Bright's disease, etc.,

of which the history is to hand—the early link in the pathological chain was forged on the drill-ground. There has preceded the date of appearance at hospital a long period of uncomplained-of discomfort, often distress, consisting of breathlessness on slight exertion, headache, and heart-beating. Now exertion has become unbearable. A man who never knew he had a heart—an expression many a soldier has used to me—becomes aware of his possession after a few months' dilating drill. He blames his recently-donned pack or valise for his trouble, forgetting that as a civilian he could have carried it manfully across country for ten or fifteen miles. Now, has this man been enlisted by mistake? Or have we made him what he is?

This has proved more of a digression than I intended. To return: We find, then, firstly, that in the distended chest the cardiac impulse is lower down and nearer to the middle line than it ought to be, the site of impulse often varying in successive beats; its area appears to be increased; it can be even *seen* to be abrupt and jerky, and in many cases there is marked epigastric pulsation. On placing the right hand firmly on the cardiac region and the left on the back, we find the cardiac systole to be much more powerful than is natural, so much so sometimes that it shakes the body visibly. We are surprised at this, *for the man has been only standing*; and this excited action exceeds what would be expected even during active exercise. The condition of the walls and floor of the chest is maintained as before described, the respiration (shallow, and therefore increased in frequency) being performed by deficient elevation of the diaphragm—complete relaxation of it being prohibited—and very slight descent of the ribs, followed by the only further enlargement (by way of inspiration) that can take place, and this is very small, for lateral expansion has already been attained almost to the uttermost limit. The heart contracts about 110 times in the minute, its rhythm being irregular both in time and force in many cases. The right ventricle is found to be acting unduly. The respirations average 40 in the minute. There is a curious mixture of anxiety and resolution visible in the recruit's countenance. The man before us may have no hypertrophy as yet, and no murmurs indicating valvular inefficiency can be heard.

Now, secondly, the state of heart just described points to impediment, to obstruction, to the circulation. We shall now see how the obstruction comes about. Tight clothing, etc., may well be a cause of obstruction from without. I shall show that the attitude which the recruit is compelled to assume and maintain (for here lies the mischief) is a cause, more powerful, of obstruction from within. Let it be remembered that "as the thorax is a closed cavity, in which a partial vacuum is produced by the act of inspiration, while its contents are compressed by the act of expiration, the former state will favour the movement of blood from the large veins on the exterior of the cavity towards the heart, whilst the latter condition will retard it." The quotation is from Carpenter's Physiology. This author then proceeds to detail an experiment (to quote again) "showing the suction power of the inspiratory movement and the expellant force of the expiratory act." And he adds: "On the other hand, the expiratory movement, while it directly tends to cause accumulation in the veins, will assist the heart in propelling the blood in the arteries." Can anyone question the importance of these or of any other physiological laws? What then, if the act of expiration be to a great extent in abeyance? *A disturbance of the balance, which exists in health,*

between the pulmonary and the systemic circulations. This is the inevitable result, as we shall see. Here, gentlemen, is the blot in recruit training—that it brings about a disturbance of the balance which exists in health between the pulmonary and the systemic circulations. If I thus repeat the phrase it is because it lays down the essential evil of chest expansion as required of recruits. But will not the balance be restored when the recruit, off parade, is allowed to breathe as nature would dictate? Yes; the balance will be gradually restored, and the heart will become quieter, only to be disturbed again at the next drill-hour. This is the manner in which we produce "physique"—the synonym for looking formidable on parade and being useless for work, or else for doing the work in a condition of discomfort, distress, or exhaustion, as the case may be. Gentlemen, the British soldier is very plucky, and no man likes to "give in" less than he does. It is pitiful to see him trained to break down; for he will still go on, bathed with the cold dews of exhaustion, rather than fall out of the ranks. Considering that he is selected for being likely to prove efficient, I hold that, in time of peace at all events, the chances as regards heart and lung diseases are in his favour, rather than in favour of the civilian. I cannot now discuss this point. I am confining myself to the question of the artificial dilatation of the chest, and just now to the manner in which the balance of the two circulations is disturbed by it. But I commend it to you as being a tenable position, if only we would allow the soldier to breathe at all times physiologically as the civilian does, tight clothing and weight carrying in both cases notwithstanding.

The inspiration, then, a deep one, which the recruit takes at the word of command, produces physiologically an acceleration of the movement of blood from the large veins on the exterior of the chest, which movement of blood towards the heart *had been retarded by the previously occurring and duly performed expiration.* Now, as expiration is not, after the word of command, again duly performed, and as the position of the thorax is one of deep inspiration and remains so, does it not follow that in a given time, a larger quantity of venous blood will have passed into the right side of the heart than would have passed if the check or retardation which the expiratory movement properly performed exercises had been imposed? I do not quite contend for a "vis a fronte"; if that were established for a moment it would soon be disestablished. The right ventricle contracts vigorously, but the blood it drives forward for aëration cannot part with as much carbonic acid or receive as much oxygen as if respiratory movements were normally succeeding each other all the time. The degree in which the exhalation of carbonic acid suffers hindrance is in direct proportion to the impurity of the air in the ultimate air-vesicles. This air is only changed (if it can be spoken of as being changed) by the law of diffusion of gases; but in the absence of efficient expiratory movements this law is at a considerable disadvantage for the purpose required. If the recruit be now required to double, the breathlessness is quite urgent. The right ventricle is much embarrassed. Breathlessness in the recruits' drill field means obstruction to the circulation, and obstruction to the circulation means excessive strain on the heart. This, again, means pathological changes in the shape of hypertrophy with or without dilatation; and this, further, may mean—though, perhaps, it rarely does—inefficiency of the valves, for, if the orifices increase in size, the valves which should close them do not.

Now, the systemic circulation is also injuriously affected; for the engorgement of the lungs arising as described, must, however slight, result in a retardation of the current of blood in the pulmonary veins, which is taking place towards the left heart; and not only so, but the arterial blood reaches the left ventricle insufficiently oxygenated, and also in deficient quantity. For, not only is the lining membrane of the pulmonary veins extremely sensitive to the passage of impure blood, but a most important movement—which is, perhaps, one of the chiefest aids to the advance of the arterialised blood towards the left auricle, the expiratory movement—is being held in check. The force of the right ventricle may be said to be expended in sending the venous blood to the pulmonary capillaries, and as some obstruction is already there, the pressure exercised normally on the pulmonary veins in expiration is much needed to maintain the circulation in them. The right ventricle does all it can, and hypertrophies that it may do more by-and-bye. The left ventricle receiving blood deficient in quantity and in degree of aëration, the wants of the system are not duly supplied; and the muscular and nervous structures of the heart itself must suffer. But the contraction of a deficiently-filled ventricle is mischievous to the ventricle, as is also that of an over-distended one. And distension of one side, with an insufficiently-filled state of the other, constitute, it must be admitted, a disturbance of the balance of the two circulations. Can we wonder, then, that when examining the recruit at his drill, we found his heart in the condition described? Is there not ample cause for it? The fact is that expiration is forgotten—what does the drill-sergeant know about it?—and the erroneous idea prevails that the man with the dilated chest is a fine, able, soldierly fellow, although he cannot compare in staying power with a man of much less chest-measurement who knows nothing of the injurious practice of chest-swelling.

We shall see, on a little further inquiry, that the chest-swelling ordered by the drill-sergeant is totally indefensible, and nothing but evil can follow it. It should be recognised that the full power of expansion of the lungs should never be exerted by an effort of the will—except under special circumstances. For instance, the singer—in anticipation, not of the requirements of the system, but in order that he may have the requisite amount of air to expire for the execution of a passage which would suffer in effect if broken by a fresh inspiration—expands his chest to the full extent to contract it again gradually, *but immediately*, by a correspondingly deep expiration. We take the same precaution in reading aloud, to avoid drawing our breath in the wrong place. It is for such requirements as these that the respiratory movements are placed so much, in the human subject, under the control of the will. But who will show that the breathing of the soldier on parade, marching, or doubling, should be conducted otherwise than automatically? The chest movements ought to vary in extent in accordance with the amount of blood sent into the lungs for aëration, which amount of blood, again, ought to be regulated by the natural forces which accomplish the movement of blood in the veins; but they ought not to be impeded by attention being in any way directed to them. Much less should they be grievously hampered in the way I have described. The movements of inspiration and expiration (to put it more plainly) increase in depth when the body passes from a state of rest into one of activity, for two reasons. Firstly, because the blood reaching the pulmonary

capillaries is now flowing towards them more rapidly, owing to the pressure exercised by the muscles on the veins throughout the body. Secondly, because the demand for oxygen by the system is increased owing to the increased chemical changes which take place as a consequence of muscular contraction. Now, the degree of chest-expansion, which the recruit, as he stands to be drilled, is made to assume, is greater not only than would be automatically dictated by the conditions in which he is placed, but is even greater than that occurring as the physiological consequence of active exercise—a degree of expansion, indeed, which *ought* to imply that vigorous muscular aid to the circulation was obtaining, and that, too, accompanied by movement of (as against a stationary state of) the body.

We come, thirdly, to the manner in which the recruits' distress is brought about. I find that under the previous headings I have, unavoidably, shown that dyspnœa is a certain consequence of the respiratory movements being impeded. I need not now repeat how, but I will say once more that expiration is as important as inspiration, and that that important act is interfered with for the recruit. Dyspnœa, then, according to its degree, involves exhaustion, distress, discomfort, or a mere feeling of irksomeness, as the case may be. I have said that those who most accurately carry out the orders suffer most. Now, some men can attain, owing to their figure in general assisting the effect, a degree of thoracic prominence sufficient to please the military eye without any very great hyper-distension of the lungs. Even for these the word "irksomeness" would but feebly express their sensations. There are other men who, being less shapely, can escape rebuke only by distending the lungs with air to such an extent as speedily induces almost a doubling of the pulse rate: of which result the deficient supply of blood to the left ventricle is the explanation. These men are distressed urgently in a few minutes. An order to "stand easy" has not yet restored the disturbed balance of the pulmonary and systemic circulations, when this unphysiological, injurious, process is commenced anew. This is obstruction to the circulation from within. It is worse than that (of tight uniforms or accoutrements) from without. For, in the latter case the cause of the mischief is apparent to the sufferer—he can, and does, in the fight, remove it. But he does not know, and he cannot remove, the disability inflicted on him in the drill-field; the existence of which it only required a little extra work and weight-carrying to make manifest. The results of acute rheumatism to the valves we know; the palpitation and irregularity of heart's action due to anæmia, general debility, or hysteria, we also know; but what is this? It is the result of the recruits being "perfectly exhausted after their morning's drill"—to repeat the quotation from the essay I have alluded to. Even if it could not be shown to be injurious, does not common-sense disavow such a mode of training?

Fourthly, and lastly, what pathological changes may be induced by the setting-up-drill?

It is too much the habit to say that cardiac affections are merely functional when we do not happen to hear cardiac murmurs. Functional disturbances of cardiac action may be, and often are, accompanied by murmurs; but when do we see such a case in the soldier? The fact is that, examine as we may, we cannot find the organ, or decide upon the condition—say, of anæmia or plethora—which is to blame for this so-called "functional" disturbance in the

soldier. The case, at first sight, looks much less urgent, less serious, than functional derangement properly so called. Look, then, for organic disease. What other name can you give to hypertrophy? This is not to say that you cannot have a case of irritable, or "soldier's heart" without manifest hypertrophy; but neither is it to say that "soldier's heart" does not result from organic changes in the heart structures. Hypertrophy is very common in the Army. Now, we saw that the blood reaching the left side of the heart was deficient, not only in degree of aëration, but in quantity, during the drill. We also saw that the expiratory act is a powerful aid to ventricular contraction. The conditions of healthy ventricular contraction are thus gravely altered, for the coronary arteries convey more or less impure blood in deficient quantity, to the muscular and nervous tissues of the heart. We cannot wonder, therefore, at the frequency of hypertrophy, or of dilatation, or the rhythmical irregularity so frequently associated with heart dilatation, or at the palpitation on slight exertion, with breathlessness and distress, for which so many young men are invalided. There are pathological changes induced that account for these things. For it is antecedently probable that a disturbance of the balance existing in health, between the pulmonary and the systemic circulations, will lead to a disturbance of the balance of power between the pneumo-gastric and the cardiac ganglia.

Gentlemen, I have curtailed the statement I wished to submit to you; but I trust you will let me say that I have shown that the mode of dealing with the recruit's chest is artificial, being in contravention of physiological laws; that it is injurious, and *that* to the most important organs of the body; that the causes of the visible embarrassment of the recruit's heart under training have not been sufficiently considered; that the embarrassment of the heart itself, which the training infallibly induces, has not been suspected of a significance that its continuance for many months for several hours daily might induce organic disease. In a word, that the recruit is the victim of the drill sergeant's ignorance and superstition. And the evil is all the greater because it is done in the name of good. It is difficult to root out errors that have long prevailed, and the Army is very conservative; but this matter ought to be attended to. The remedy is quite a simple one. If adopted, the men will work well, look well, because they will feel well; they will go through thrice the amount of actual exercise, and return to their barrack-rooms undistressed, unexhausted. For, were they not selected only the other day as in all respects eligible? This point does not receive the attention it deserves. We ought not to treat it as inevitable, or say, in an off-hand manner, "better invalid him," when we find a young soldier, who has yet had none of the vicissitudes, but rather the pleasant side of military life; never abroad, perhaps; better off in the Service than ever he was out of it, suffering from hypertrophy or dilatation, or both, or these combined with and causing valvular insufficiency. There has been no rheumatism or Bright's disease. Why is his heart hypertrophied? Why is he breathless except when at rest? Because he has been a man of war (without seeing war) for a year or so? What would have been the chances against his finding himself in his present plight if he had remained a civilian? Shall we put it all down to the tight tunic and accoutrements, or shall we pay any attention to what has preceded the wearing of them, namely, the distress and "exhaustion" of recruits' drill—the departure from the

physiological conditions of the circulation and of respiration which I have shown that drill to entail? What shall we assign as the cause of hypertrophy already developed in recruits not yet "dismissed drill," and who have been "trained" in a loose serge frock? Will it be admitted that a case is made out for the recruit? or are we to fall back on tobacco, alcohol, excesses of any kind—except excess in military chest making—for causes of this most common disability? We are aware what a striking contrast would appear if the state of heart of, say, 50 civilians were compared with that of 50 soldiers, taking those who have never been known to complain of cardiac trouble, and taking any civilian men, haphazard, of about the soldier's age. The soldier ought to have the advantage here; but he has not, though he is a carefully selected man. The civilian can accomplish the distance and carry the weight with less distress than the soldier. Why? Because the soldier has been trained. For, gentlemen, the position I have tried to maintain is that the recruit is compelled to outrage physiological laws, and that he must—and so must the Service for making him—pay the penalty.

Gentlemen, I now leave technicalities, but I beg your permission to add a few general considerations. A well-known newspaper correspondent, who was a witness of the performances of the men lately under Colonel Pollock at Hounslow, wrote his impressions concerning them. You understand of course, that military training does not enter into my calculation at all, nor am I propounding any system of physical training. I am pointing out a blot in the existing system, of the value of which, in other respects, it is for military, not for medical, men to judge. The thing that most struck this correspondent in Colonel Pollock's men was their "abounding energy," their "enthusiasm," their "keenness," their readiness to do more work than was required of them, gymnastic or other, and that was not a little. What a different tale is this from that of the medical officer of the Guards, who had often seen recruits, as I have, "perfectly exhausted after their morning's drill." Now, in what respect did Colonel Pollock's training—physical training—differ from the usual method? I approached him before he began his work, and he felt, after what I said, that it would be well to abandon interference with natural breathing; and he wrote to me undertaking to exclude breathing exercises. He wrote: "I will do more than you have asked me to do" (I had asked him to exempt, for purposes of comparison, 25 of his 100 men); "I will undertake that no breathing exercises whatever shall be performed. I freely admit that, but for your letter, I should have used the breathing exercises, not because I am an ardent believer in them, but because they form a part of the regulation system." You will, perhaps, think that the fact that Colonel Pollock had no invalids and no deserters—and you know that desertions are most frequent among soldiers of under three months' service—does not prove anything. And I do not say it proves much; the number of men was small. But is there not encouragement to try how the waste of the Army might be affected by training the next 10,000 recruits without chest-expansion, and comparing the numbers of invalids and deserters from their ranks with the number from the ranks of men whose setting-up drill has been conducted on the time-honoured plan? Is there not encouragement to hope that the keenness, enthusiasm, and abounding energy displayed by men whose breathing was left to Nature, might be displayed by the 10,000 upon

whom I suggest a similar freedom should be conferred? I hope the influence of this Institution will be brought to bear. I believe that our interference with natural breathing produces deserters as well as invalids, and these do not give a good name to the Army. They influence recruiting prejudicially. Surely a young man's inclination is to stick to the calling in life which he has taken up if only he be physically comfortable in it. The average soldier is better off after than he was before enlistment. Why desert? Is it the restraint of discipline he objects to? He cannot earn a living at *anything* without some kind of rules and regulations and discipline. I suggest to you that he is made physically uncomfortable, breathless, and palpitating by the injurious process I condemn, and within three months a high percentage of these youths desert. It can be positively settled in the way I suggest, and with the advantage Colonel Pollock's men received by their training, whether the inevitable discomfort of chest expansion is responsible for desertion from the ranks; and the claim is a reasonable one: that a natural function be left to Nature.

Then I suggest to you that the staying power which Colonel Pollock's men displayed—the power of doubling for a mile and a half without a break—could not have been arrived at under chest-swelling. Can you imagine an Oxford or Cambridge crew doing setting-up drill as a preliminary to boat-race practice?

Now I daresay many of those present are asking themselves: "Can the manly, soldierly bearing or presence which the soldier must have be attained without prejudice to his well-being?" The question has been answered by the men trained by Colonel Pollock. It has been more than answered. Military men may be inclined to contend that by the abandonment of chest swelling there would be loss in the matter of appearance. Not only will there be no loss, there will be, on the contrary, gain. For if a position or attitude be unnatural, even if it were not injurious—as things unnatural invariably are—it cannot be honestly described as manly, elegant, beautiful, or by any other fine adjective. I have shown it to be unnatural. It may be striking, but it is a deformity, and, as I have shown, an actively injurious one, which cannot be said of most deformities; and the idea that it is not a deformity, but the reverse, will be given up. What is often called "fine physique" in the Army is, in reality, deformity; and the break-down under training proves that this is so. On the ground of appearance, then, this puppet-like attitude should be abandoned. We have seen men whose military appearance leaves nothing to be desired, trained without chest swelling, covering a mile in 8 minutes and doubling a mile and a half without a break. What soldier goes in for chest swelling in stress of battle? Is it not his duty to take every tiny bit of cover, from behind which (having made himself as small as he can) to fire on his enemy, who he knows is doing likewise? But I want to say that this making oneself small is a safe process in every sense. I recommend no interference with natural breathing. The soldier should be told *nothing* about this automatic act; but full expiration is sure to be followed by inspiration to the necessary or physiological extent, and no effort of the will can prevent it, whereas the reverse of this proposition is not true; the will *has* power to hold the act of expiration in abeyance, and this, unfortunately, is what our men are told to do. If it were desirable, which it is not, to direct a man's attention to his breathing at all, it would be safer, for the reason given, to advise him to keep his chest unexpanded rather than

expanded. But Nature has not left the integrity of the heart and lungs, and the due performance of their functions, dependent on anyone's knowledge. We breathe correctly asleep or awake, quite unconscious that we are doing so. Indeed, to be conscious of breathing almost means interfering with it. When I put these views (as to chest swelling) forward some 30 years ago the medical Press said: "It was not in this way that the old Roman soldier was taught how to endure the hardships of war, and the Roman legions to obtain the mastery of the world. There was no standing 'bolt upright,' keeping their chests in an artificial state of distension. Military exercises, observes Gibbon, were the important and unremitted object of their discipline. The recruits and soldiers were constantly trained both morning and evening, and care was taken that the arms destined for this imitation of war should be of greater weight than those for use in real action. Their exercises comprehended whatever could add strength to the body, activity to the limbs, or grace to the motions. We might certainly take a lesson from them, and replace the unhealthy drill of the present day by some of those practices which brought the Roman soldiery to such a state of physical perfection." Surely, gentlemen, the attitude of an individual conscious of his strength is not that which the soldier is taught to assume. It is a most unstable attitude. When ever did painter delineate, or sculptor model, the figure of an athlete or warrior in any attitude even remotely approaching that of a soldier at attention? I regret that time does not allow of my laying before you the argument, founded in anatomy and physiology, against the order which directs that, in the attitude of "attention," the weight of the body is to be on the fore part of the feet. But I believe you will hold me absolved when I tell you that in adopting for use in elementary schools the military model of the attitude of attention, including both chest expansion and the order I have named for the disposition of the weight of the body, the compilers of the syllabus of physical exercises append the following note of warning: "It should be remembered that the position of *Attention* is one of strain, and scholars should, therefore, never be kept in this position for more than half a minute at a time." Is the comment necessary that it is training we want—not straining? An attitude of strain, gentlemen, insupportable without injury for longer than half a minute! Common-sense disavows these foolishnesses, and practical soldiering should have none of them. Find the Zulu, the Boer, or the Japanese who would adopt them.

It only remains to say that while nobody has attempted to question the validity of the argument which I have had the honour of putting before you, I am able to bring—and I think I owe it to you to bring—to your notice some of the support which that argument has received. And first I shall quote from a long letter from Professor Keith, the Lecturer on Anatomy at the London Hospital Medical College, who permits me to do so. After stating his agreement in my view, he writes: "I found some three years ago, when giving a lecture at Toynbee Hall, that the 'models' which had been provided for me from the Army Medical Corps could not take an abdominal breath; they had absolutely lost the normal manner of breathing. They were emphysematous, although young; the elastic tissues of their lungs, so essential for a free pulmonary circulation, was more or less destroyed, and all the conditions of cardiac hypertrophy you describe were present. . . . I found the two models were typical of what is produced

by 'training'—poor devils, they are maimed, not trained. Pulmonary phthisis ought to be common in the Army." I cannot quote the whole of this letter. It will be of interest to many here that a form of phthisis—the fibroid form—is common in the Army (a form often quite independent of tuberculosis, but leading to destructive lung lesions). Dr. Aitken, Professor of Pathology, many years ago, at Netley, described it in his work.

Then the late Dr. Walshe, of Hyde Park Square, a writer on heart disease of European reputation, wrote: "I thank you much for putting me in possession of your views on this subject, founded as they are on careful direct observation, and supported by common-sense and physiological argument. It seems to me indubitable that the chest-dilating process *must* produce the evils you so graphically describe."

From the late Dr. Hilton-Fagge's work on medicine, I must make a quotation also. Referring to a paper by Professor Veale on hypertrophy and palpitation, he says that Professor Veale (in A.M. Report XXII.) assigns these disabilities "to no fewer than seventeen more or less distinct causes; but," he continues, "it seems to me far more likely that some one cause is really responsible, and I am very much disposed to think that the real solution of the difficulty has been found by Surgeon F. A. Davy, who (in Army Med. Report XVIII.) refers it mainly to the setting-up drill, in which recruits are compelled to 'swell the chest,' so as artificially to expand it. . . . . Dr. Davy shows that in consequence of free expiration being prevented, the functions of the heart and of the lungs must be very seriously interfered with. . . . . It is surprising to me that Dr. Veale does not allude to this view of the matter, which appears worthy of the most serious consideration of the military authorities."

The *British Medical Journal* took the same view, and said: "If the drill be to blame—and it appears to be so—then the sooner it is reformed the better."

The late Professor Maclean, of Netley, gave his adhesion also, and published a long review of a pamphlet of mine on this subject in the *British Medical Journal*. In it he pressed the importance of the matter, and said: "Great will be the responsibility of the military authorities if they turn a deaf ear to these representations."

The independent opinions I have given you, gentlemen, show that this matter should be looked into; that it is urgent; that it concerns the contentment, the efficiency, the popularity even, of the Army. Shall the reproach continue, that there is a grave blot in our training? Who will contend that our system is so good that it cannot be improved? Are we to progress in everything but recruit training? Can anyone advance a sound reason why chest swelling should be persisted in? Is it not abundantly plain that it is contributing largely to the waste of the Army? There is the unnecessary suffering of the men, the avoidable heavy cost to the State. Every consideration of the case, of expense, of efficiency, of humanity, suggests the necessity of reform, and that urgently. And then think of how easily the reform can be accomplished. Advice on the matter resolves itself into this: That we abstain from certain evil things, namely:—

a. Chest dilatation.

b. From the order directing that the fore part of the feet is to bear the weight of the body.

c. From movements for "opening" the chest. We have seen to what *that* amounts.

Start from a basis of real military necessity, making the men practice only such work and exercises as are required for fighting efficiency. Abandon the false idea of human perfection of figure, as it is now supposed to be exemplified by what is called "the first position of the soldier," and instruct the drill-sergeant to improve the faulty symmetry of awkward-looking men by directing their attention not to their chests, but to the fault, whether unequal height of shoulders, head held too much forward—whatever the fault may be.

Corrections of the above kind to be made not alone when men are standing, but when they are doing military movements and evolutions; for thus the great disadvantage will be got over of keeping men long standing still—a far more important thing than officers realise.

As the soldier is a man whom we select as fit for hard work and are bound to further prepare for it, let us give him hard work of the kind soldiers must be able to do: marching, running, weight carrying, the special exercises of the weapons he must learn to handle. He will be content to do work which he can see to be real work and useful work, that will healthily fatigue him, not uselessly exhaust him. As a military horse can be trained to staying power and accuracy of movement, it being impossible to interfere with its respiratory organs so let the man be trained. Let interference with the soldier's breathing be thought equally impossible; and, once again I say, let military movement take the place of military standing still. Even the attitude of so-called ease, if prolonged, fidgets and irritates.

In conclusion, gentlemen, contentment, the sense of well-being in the ranks, and the presence or absence of enthusiasm for the soldier's work are necessarily dependent on the details of soldiering. Can there be a more important detail than that we have been considering? The British soldier has otherwise little cause for complaint; certainly none if we compare his surroundings and terms of service with those of other Armies. Steps are being taken to secure his spiritual welfare. Considering what I have put before you, is it too much to ask that the dictates of science and reason should be heard for his physical welfare? All of us acknowledge real military necessity; it is because I have been able to show that the practices I have brought to your notice cannot be properly described by that name that I have undertaken to condemn them as false, unnatural, and injurious.

Is it not due to the soldier, the Service, and the public that the necessary changes should be made without delay?

Colonel S. P. Rolt, Inspector of Gymnasia:—As Inspector of Gymnasia, and, therefore, directly responsible for the training of the instructors and the supervision of the training of our recruits, I should like to be allowed to make a few comments on Colonel Davy's most interesting and instructive lecture. I think he has rather misinterpreted some of the regulations. He says, "The recruit knows that notwithstanding the discomfort, he must keep his chest expanded," and he explains that the recruit consequently maintains his chest in the position of full inspiration and thereby restricts his breathing. Now, I do not say that such a thing has never been done, but I do say that there is no justification for it whatever in the existing regulations. Certainly not under the position of "Attention," nor is it in accordance with any of the principles of physical training which have been in force in the Service for the last eighteen years. The "deep breathing" exercise, as it stands to-day in the Training Manual, is practically never performed as a "chest-swelling"

exercise, as Colonel Davy calls it. If the recruit, however, has assumed these injurious attitudes, as no doubt has been frequently the case, it points to the necessity for more "expert" supervision of the drill training. The ideal state would be for every officer and N.C.O. to have a thorough knowledge of the principles of physical training just as every schoolmaster and shoolmistress in our elementary schools should, and in future will, I believe, have the same knowledge. Such a knowledge cannot be gained in a few days by reading a few regulations and instructions; and until we approach very much nearer to the ideal than we are at present, I feel that the actual physical training of recruits should be kept in the hands of "experts." By "experts" I mean officers and non-commissioned officers who thoroughly understand the physiological considerations and principles of systematic and gradual progression, and endeavours must be made to promote a better knowledge of these considerations amongst those responsible for the drill. I make a distinction between the physical training and the drill on the barrack square. Again he says, "Are we to progress in every respect except in recruit training?" I do not think he is quite up to date as regards what we have been doing in the Physical Training Departments of the Army lately, and it may interest him to know something about it. For the last year at Aldershot we have been at work drawing up a system of physical training that we can apply to our recruits. This system is based on that which has been in use in Sweden for nearly a hundred years, and which has been adopted in its entirety by many other nations with the full approval and support of the medical profession. We are compiling a Manual embodying this system, which will, I hope, very shortly be ready, and judging from Colonel Davy's expressed opinion I think he will be in full agreement with the principles enunciated therein. It is also the intention of the authorities to alter the drill manuals in accordance with the same physiological considerations. A committee composed of some of our leading medical men, both military and civilian, appointed last autumn by the Army Council, is devoting its earnest attention to the matter. The Danish Government has lent us the services of an officer possessed of highly expert knowledge in physical training, who has been with us since last August, and will probably remain with us one or two years to lend us his assistance in conjunction with our medical officers. From the above outline Colonel Davy will, I think, admit that far from neglecting the all important subject of recruit training, we have fully realised where that training requires improvement. Colonel Davy refers to the training of Colonel Pollock's Company at Hounslow. I should like you to hear from Major Moore, who is present, and who is the superintendent of the Gymnasia, his opinion of the comparison with our own recruits.

Colonel G. MALCOLM FOX, H.M. Inspector of Physical Training (Board of Education):—Although I have listened with careful attention to the lecturer's address, I must admit that I find it difficult to answer, as I cannot trace through it any logical sequence of thought. From start to finish, the past is ever present. Any data that are given are valueless or misleading owing to a glorious absence of detail. The address opens with a reference to a paper read by Professor Maclean over 40 years ago, dealing with Army conditions prior and up to the year 1867. That paper evidently dealt with the wastage in the Army by invaliding, and I have no doubt the remarks then made were of high value, but can we take them—as evidently Colonel Davy desires—as being applicable to the present year, 1907? Is the drill and training of the Army of

40 years ago the same as that of to-day? Are the conditions of the soldiers' life as regards food, dress, barrack-room accommodation and general hygienic surroundings the same as in the year 1867? If the conditions of the Army as regards these essentials of a soldier's life have not changed since that date, then all that can be said is "God help the Service!" because it has remained stationary when every other profession and science has advanced. Now, Colonel Davy begins with his own experience of the Service, starting in the year 1861 and terminating in 1906—a period of 45 years. During these 45 years he is personally aware of the discharge of 833 men from the Service due to heart trouble. He remarks that this statement is startling, and so it is, but the startling element is, that one is left in profound darkness as to the distribution of these 833 cases during the 45 years. From anything written or inferred, the whole 833 may have occurred in the first year. For such a statement to be of the slightest value or to be used as an argument, the number of such cases discharged each year, or even in periods of five years, must be given to permit of comparison. What would be the value of any medical treatise dealing with, say the death rate of diphtheria during the last 45 years, if only the sum total were given for that period, and not the proportion assigned to each year of the 45? Such a method would render it impossible to show the reduction in the last few years due to modern methods of treatment. I must confess to being startled at such a hopelessly unscientific basis on which to found an article. Colonel Davy now comes to times a little more up to date, and he gives us a summary of the arguments used in a paper written in the year 1867, and published in the A.M. Blue Book of that year—just 40 years ago. With these it is not necessary to deal, as the arguments of 40 years ago are now really of little value. Again, there is a big jump from 1867 to the present year, 1907—at least, I must infer so, because the paragraph begins, "Let us now approach a body of recruits as they are being drilled, etc., etc." Is the body of recruits standing at attention, standing at ease, or what? I think, however, that one may infer that they are standing at attention; at least that is the impression derived by myself. Having approached the recruits, Colonel Davy notes certain defects—Elevation of the ribs, Scaleni muscles in action, great depression of the Diaphragm, etc. Were these recruits stripped to the waist? He does not say so. If they were not, these observations are scientifically as valueless as his data of the discharged heart cases. It is to the position of attention, however, that most of Colonel Davy's objections are directed. Let us look at what the position of attention really is. It is simply a starting position, namely, a position of alertness of mind and body for immediate action. The main directions for it are:—"Shoulders and body square to the front"; "Arms hanging easily from the shoulders"; "Hips drawn back"; "Chest advanced *without constraint*"; "Feet at an angle of 45°"; "Weight of body on the fore part of the feet"; "Head erect"; "Chin drawn *slightly* in." Please note "*Easily*," "*Without constraint*," "*Slightly*." Now, what are the effects produced on the body by these directions properly carried out? Muscular action is called into play and the Spinal Column (composed of a series of superimposed bones jointed together) is brought more into a straight line, thus causing the dorsal backward curve of the spine to be reduced, and the ribs attached to the spine in that region are carried forward with the spine, hence shewing a greater forward prominence of the chest. Not the distended, puffed-out chest of Colonel Davy, but the chest with its diameters but slightly increased and without restraint, transferred from rear to front. What is the chest? It is the case which protects the lungs. Made up of the spine at the back,

breast bone in front, and the ribs attaching the spine to the breast bone. All the ribs are attached to the back bone, but the six upper ones are directly attached to the breast bone and the seventh indirectly. The five lower ribs are not attached to the breast bone, hence it stands to reason that the upper part of the chest is much more rigid, forming practically a box; whereas the lower ribs, being unattached in front, have a much freer range of movement and hence have an infinitely freer range of movement during the act of respiration. In the chest we have the lungs, composed mainly of air cells; the diaphragm, which is a strong muscular partition forming the floor of the chest. It is cone-shaped with the apex upwards. During inspiration it becomes flattened downwards, and as it flattens there is a gradual filling out at the foot of the breast bone. Now, the proper position of attention, instead of impeding the act of respiration, is of the greatest aid to it, because the slight bending back of the chin and the drawing back and down of the shoulders helps to fix the upper comparatively immobile part of the chest, and for the purpose of breathing we must look on the chest as divided into two parts: upper ribs attached to breast bone—comparatively immobile; lower part ribs, unattached—mobile, and in conjunction with the diaphragm, acts as a bellows and is constantly varying its movements and capacity, and this is aided by the fixation of the upper part of the chest. So, as regards the proper position of attention, I find myself quite at variance with Colonel Davy. I look upon it as a position which aids the act of breathing, and hence tends to improve the physique of the recruit. It is not the heart-hypertrophy producer and consumption maker that he would wish us to believe. To those who dislike a maze of technicalities—"sternum, diaphragm," etc., etc., I would ask for a simple experiment. Strip in front of a looking glass, place yourself in the proper position of attention, remembering "Easily," "Without Restraint," "Slightly." In that position draw in a deep breath and note in the glass the rise and mobility of the lower mobile part of the chest. Then drop the head and slouch the shoulders and again draw in a deep breath. I ask no more—no less. Anyone can compare for himself. Return for a moment to my statement that attention is simply a starting position—one of bodily and mental alertness. Alertness of the body is what? All the muscles in a state of slight tonicity ready to act. Now surely no one in their sober senses would ever think of keeping recruits in a starting position for an indefinite time. Of course this starting position must be acquired by gradual and progressive physical training, but once acquired the position of the chest becomes habitual and natural to the subject, and why not, when we know that this position of the chest means increased mobility of the lower breathing half of the chest and increased lung capacity, and hence improved health to the subject. Does not every trade leave its imprint on the tradesman? The collier, with his cramped slouching gait? The cobbler with his contracted chest? Why not the soldier with his chest advanced in the right position—NOT SWELLED or DISTENDED—an object lesson to all who wish to give their lungs the freest play? Colonel Davy has referred to the Oxford and Cambridge boat crews. He asks, "Would they be benefited by 'setting up drills'?" Ask any one of either crew, who have ever rowed in this classic race, if it 's not essential that the chest must be kept forward, and that they must sit back on the bones of their pelvis. Is it not a crime to tuck in the belly or contract the chest anywise in a forward direction? Why? Because it interferes with the mobile lower part of the chest. Still further, our Volunteer forces who attend drill after a long day's work in civil life, do they complain of this position? Do we hear grumbling from our schools? In

Sweden (the best physically trained nation in the world) this position is strictly insisted on because of its beneficial effects on ordinary respiration. Do we hear from them an alarmist outcry? Again, look to our ablest elocution teachers. The position they use as regards the carriage of the chest is exactly that of attention. Why? Because they practically knew that that is the position of free and easy breathing. So it is with the sprinter and long-distance runner, who at the finish of the race "breasts the tape," head up, chest forward. Last, but not least, to bolster up an unscientific argument, Colonel Davy calls in support the recommendation in the Elementary School Syllabus: that the position of attention is one of strain and must never be used for more than 30 seconds. Surely, had he given this even a passing thought, he must have grasped the fact that this code was prepared for little boys and girls from the age of seven years, a distinct proportion of whom were well known to be either underfed or of poor physique. A careful perusal of the introduction to this code would have clearly shown that the strain there referred to is not heart or lung strain, but the neuro-muscular effort involved in keeping children (many of feeble physique) in a more or less fixed position for an unduly long time. It is surprising to find this warning given to our board school teachers against neuro-muscular strain, interpreted as an argument in favour of the heart-hypertrophy and lung distending effect of the position of attention in the case of the recruit—a young man, selected after careful medical examination, because of his physical fitness. It vividly recalls to me that noted "memorial" out of which King Charles's head could never be kept. This brings us now to the deep breathing exercises against which Colonel Davy comments most adversely. His adverse comments are wise if he thinks that the objects of these exercises are to distend or swell the chest. If that is the object, it would indeed be wiser to train our recruits to all become Bassoon players, and to thus produce the pathological condition of Emphysema (over distended air cells), and a consequent permanent chest swelling. That is not the idea at all of properly carried out deep breathing exercises, the object of which is the healthy functioning of the lungs by long deep inspirations, followed immediately by long deep expirations; both of these acts calling into play, outside muscles to aid, as far as is reasonable, these efforts. These exaggerated efforts bring to the lungs a greater supply of oxygen and carry away an increased amount of carbonic acid; but, further, they hasten the interchange of oxygen and carbonic acid between the reserve air of the lungs and the ordinary atmosphere breathed—a condition which does not occur in ordinary respiration—hence, it is needless to say, that such exercises done with the idea of chest-swelling are stupid and unscientific, and it again points out that the error is in the execution and not in the system. These breathing exercises are part of the daily routine of our school-children, and the medical officers in charge of our schools not only recommend, but, in many cases, insist on their daily execution. The Swedes insist on them many times daily, and always after bodily exertion. In our Sanatoria for Consumption, in early cases they are known to be of much benefit. Ortel of Munich, 20 years ago, laid stress on their advantage, combined with hill climbing, in many forms of heart disease. If the Army delete these exercises from their system, they will be taking this step against the scientific opinion of the civilised world. If it is reasonable to train the muscles of the arms and legs, is it not equally reasonable to train and develop scientifically the muscles of respiration, thus producing a supple chest capable of expansion and contraction in response to the respiratory wants when called upon by violent or prolonged exertion? Is not the strength of a chain that of its weakest link? To say the least, before departing from these exercises, one

would certainly require rather stronger evidence than 833 heart cases in 45 years. I do think Colonel Davy is basing his present opinions too much on the past, and that his impressions are like the soldiers' chests of the year 1861—too fixed. His arguments are too much based on his own paper of 1877. He has never made any reference to any changes that have taken place in the drill of recruits in recent years. He has made no reference to the most recent innovations of free gymnastics on the Swedish basis. Any soldier who has served ten years will tell you that the drill of to-day for the recruit is freer, easier and lighter than it was when he joined. The old ramrod, drain-pipe positions are dying out quickly, if not already vanished. The old methods of recruit-training are altering steadily and day by day—the same is occurring in civil life. In what civilian or Army gymnasium are to be found the old heavy dumb-bells? The whole tendency now is not to the formation of masses of muscle, but towards quickness and litheness and activity. Yet any one studying Colonel Davy's paper is left with the fixed idea that the whole system of training is the same in the Service as it was when he took over charge of Fort Pitt in the year 1861. That is not the case. It is not the Service that has stood still. Lieut.-Colonel Davy has failed to grasp or appreciate the steady advance of modern methods as regards the training of recruits. Is it not the case that the Navy have, with the aid of a Swedish expert, adopted, some two years ago, a system of physical training based on the Ling system, and has not the Army, after gradually introducing similar methods, finally introduced the same system in its entirety, aided by a Danish officer of great experience? If these two facts are true, might they not have been to the gallant Colonel a "rift in the lute," or a silver lining to his darkest cloud? Apparently he is either ignorant of the facts, or possibly he prefers the gloom and depression of the past to the dawn of brighter and happier days in the future.

Dr. H. E. Deane (late Lieut.-Colonel, R.A.M.C.):—There are a few controversial points in Colonel Davy's paper which need not, however, be gone into at this meeting. I differ from him on one or two technical points, and one is this: He says there is a great depression of the diaphragm, that the inspiration taken at "Attention" by the recruit is a deep one, and that the attitude imposes an over-stretching of the abdominal muscles. The inspiration taken by the recruit when he is called to attention is, I maintain, not a deep one. The diaphragm does not descend, but is kept in an expiratory position. That I have verified by watching a drill sergeant standing in the position of attention in front of a fluorescent screen. It was done by Dr. Bruce, who has charge of the X-Ray Department at Charing Cross Hospital. That is a thing which can be verified by any of you who choose to see it done. The diaphragm is kept in an expiratory position, and instead of descending freely, as it does in the normal standing upright position, its movement is very limited. The man's ribs were fixed, illustrating beautifully Colonel Davy's statement that it interferes with natural easy respiration. A point on which I absolutely disagree with Colonel Davy—of course, I do not do it unpleasantly—is his remark about the drill sergeant. He says that the soldier is the victim of the drill sergeant's ignorance and superstition, but he is not. Who instructs the drill sergeant? The drill sergeant obtains his orders from the drill book, which is written by that impalpable thing known as "By authority." If the recruit is a victim of anyone, he is the victim of the very highest authorities that control the regulations of the movements of the recruit, and the chief of those who are at fault I put down as the Medical Depart-

ment, who, since the days of Maclean and Parke and Riordan, have never paid the slightest attention or taken any interest in this abominable perversion of the human attitude. To illustrate my defence of the drill sergeant, I may tell you that some years ago—I am glad to say it is some years ago—I saw put up in a building connected with recruits, that when a man stood in the position of attention, a plumb-line dropped from the most prominent part of his chest was to strike the ground several inches in front of his toes! Will any gentleman present try and get into that position, and find out how impossible it is? After I left the Service and had more opportunities of going into this subject—which has been a pet hobby of mine for many years—I proceeded to further investigate the effect of this position on the recruits, and I read a paper in May, 1905, before the Royal Society of Preventive Medicine, and in that I suggested the remedy which Colonel Davy has hinted at, and which I must say at once has been anticipated by Colonel Rolt. I arrived at the suggestion he has made quite independently of him; I had no idea that he was going to make it. I wish to make just a few general remarks with regard to the men who are taken into the Army. I will take the weedy man referred to by Colonel Fox, who is squeezed into our Army as a special—at all events, he is passed as likely to be an efficient soldier. Will you tell me this: Who is the man most likely to profit by good food, good air, good housing, good hygienic conditions, plenty of leisure, some work and physical training, than the weedy individual? And yet you break him down. The improvement of the faulty attitude or the slouching position of the recruit is a gradual process. The correction of a faulty attitude and the proportionate development of the growing frame can only take place through the muscles, where important metabolic processes of our bodies go on, and the development of the muscles (and by that I do not mean simply bulk; I mean the general tone and stretching and elasticity of the muscles), and the consequent action upon the skeleton is a gradual one and must be spread over a very considerable time. The great blot in the physical training of our recruits, in addition to the one of which we have heard to-day, is the frantic, hysterical hurry that the man suffers from at every turn. He is hurried and bustled here and there. Those of you who have been in the Service know that when a man is wanted to do anything outside, the first thing that gets the go-by is the gymnasium. The attempt to do things in a hurry simply leads to inefficient results in too many cases. The point of suddenly trying to correct the shape, or rather deform the shape, of a recruit into the abominable position of attention was specially emphasised by Colonel Riordan in his book on "Heart Disease in the Army," which is the best book on the subject, to my mind, that has ever been written. The time given for all-round, efficient, physical training of the recruit—and I think some of the military gentlemen are agreed with me in this—is lamentably insufficient; and I go further and say that the requisite amount of good will not be done until that point, after receiving very careful attention, is altered. Now, introducing a remedy for this position is simple up to a certain point, but a danger has to be avoided. I agree with Colonel Davy absolutely when he says, "Draw a man's attention to his breathing and he will do something wrong." In 1893 I attended a lecture in this theatre dealing with the same subject, when I had the privilege of making some remarks, and I then said that "in about fifteen years from now something may be done." It is just about fifteen years since that time, and something is now being done. I will go further than Colonel Davy, and say that if you draw attention to a man's arms and shoulders, he will at once do something wrong. What I mean is this: When you have got the man's trunk properly balanced over the arches of his feet, his head properly balanced on the top of his spine,

his chest at once comes into its natural position, which is not one, as Colonel Fox has been trying to explain to us, of expansion. It is a natural easy position, and not one of expansion, but one admitting of expansion. Colonel Fox's remarks show very definitely the danger of talking about things without a clear idea of defining first the term used. Expansion of the chest is not the term applied to the natural position of the ribs when the spine is properly balanced. The chest comes into its natural position, the shoulders also come into their natural position, and the arms hang from the shoulders as they are meant to hang. The appendages of the trunk follow the movements of the trunk; the trunk does not follow the movements of the appendages. Tell a man to draw his shoulders downwards, or backwards, or in any way you like, beyond its natural position, and it will at once induce rigidity, and that rigidity will be at once felt in the respiratory tract. I hope you will afterwards try to do that; I am constantly demonstrating it. All these things can be demonstrated by X-Ray photographs, and a knowledge of the human frame is necessary to understand the subject. The natural erect position of a man is one of alertness without rigidity, which seems to apply to the soldier too. Just to give you an illustration of my contention, I may mention that many years ago I was trying to explain the balancing mechanism of the human skeleton to an officer, and I failed dismally. He turned round to me at once and said, "That may be all very well for the human being, but it does not apply to a soldier." So that whoever has the business of rewriting the position of attention will find it very difficult indeed to meet the requirements of Nature, and to satisfy military traditions at the same time. Now comes the remedy. Before a man can train a recruit he must thoroughly understand first of all the simple elementary principles dealing with that recruit. At present the officers do not know, because they are not taught; they are left to pick it up anyhow, and well many of them do pick it up. But the whole question of physical education in this country is in the hands mostly —and I say it advisedly—of a lot of amateur faddists, who are simply commercial men making a business out of it. As soon as you become hidebound to a system of exercise you immediately become liable to indulge in the unqualified statements of a quack. My idea of the remedy is this: Let us either have the drill sergeants instructed as to the requirements of the recruit, or what I think is better still, place the recruit during the whole of his preliminary physical training into the hands of the Army Gymnastic Staff, and have that staff properly instructed as to the requirements, which should be carried out by, or under the supervision of, the Medical Department. For the last two years I have been experimenting on this subject of the effects of exertion on the body. We want to train our recruit for the work he is going to do. When I began to go into the subject of soldier's heart and the rapidity of the pulse, I was faced with a difficulty, namely: What was the effect of exercise on the pulse normally and under different conditions? I found that nobody knew. I could get no information in the literature of the subject; I applied to some men who I thought might know, and they said they did not know. I then set to work to find out for myself. For the last two years I have been making experiments by taking simultaneous, respiratory and pulse curves of all sorts of people, amateurs and professionals, under all sorts of different conditions of exercise, and by the kindness and courtesy of Colonel Rolt—whom I should like to publicly thank for his kindness—I have hundreds of tracings of the men at Aldershot, showing how the pulse settles down under ordinary conditions and how it settled down under deep, but not forced, breathing. The results are startling. I have submitted these tracings to the greatest authority in England on the respira-

tory changes in the pulse, and he says, "I have been looking for these things for twenty years, and now I have got them I cannot explain them." Nobody knows the effect of this deep breathing introduced here, there, and everywhere. Taking a man down and putting him to do deep breathing in the middle of a day's work has a disturbing influence on his pulse and heart, which, though it may not do him any harm, can do him no good. I have some graphic records to show the effect of deep breathing which will very materially alter the physiology which is taught in the books of the medical schools at the present day.

Major CHAS. MOORE, R. Berks Regt. (Superintendent of Gymnasia, Eastern Command) :—Colonel Davy has explained certain physiological facts which are well known to experts in physical training, but which are not known to those who have not studied the subject. It is, however, very desirable that those whom one might call "non-experts," in whose hands the drill and technical instruction of the soldier is placed, should understand some of these main physiological considerations, so that they may be aware of the dangers to avoid. There is no doubt that the "non-experts" above referred to (no disparagement is meant by the term), have frequently misunderstood and misapplied the instructions contained in the official text books, not from any fault for which they, as individuals, are responsible, but owing to a want of knowledge of physiology and the principles which should govern all training of a physical nature. The recruit has, therefore, often been allowed, and even encouraged, to assume positions which were never intended by the regulations, and which resulted in high tension of the nerves and muscles and restriction of the breathing—positions and conditions which were well known by the expert to be wrong and to be foreign to the intention of the regulations. The lecturer contends that the diseases of the circulatory system among soldiers are due to such faulty positions. One fully realises that Colonel Davy's object is the same as that of those whose attention is devoted to the practical improvement of the training of the soldier. But some of the statements he makes in support of his contention do not altogether bear out his conclusions. As regards Colonel Pollock's experimental company, it is impossible to compare these men for a moment with our Army recruits. I was fortunate enough to have an opportunity of seeing these men and of judging for myself. I also understood from Colonel Pollock that 500 men answered his advertisement for 100 (he had advertised in the papers for 100 men), and that the whole of the 500 were a better class socially, intellectually, and physically than the Army recruit. The 100 men taken were picked as the best of these, and were thus, in every sense of the word, picked men. They were also a good deal older. Most of them were men who would not present themselves for enlistment. Colonel Davy also refers to the Army recruits as being "carefully selected men," and, therefore, at an advantage over the civilian. They are, it is true, selected, inasmuch as the best of those who present themselves for enlistment are selected; but, although our recruits have improved during the last few years (certainly they have in the cavalry and artillery), taking them as a whole one can hardly say we get physically anything like the best of the civilian population, or even that they compare favourably with the class from which they come; and to compare these men with Colonel Pollock's splendid material is most misleading, and no conclusion can be drawn from such a comparison which will in any way support the lecturer's contention. Again, as regards Professor Keith's letter which Colonel Davy quoted with reference to the emphysematous condition of the "models" provided by the Army Medical Corps, I would point out that the men

of this Corps are very little under the influence of the drill instructor, probably less than any other branch of the service, including the other departmental corps, and it can hardly, therefore, be argued from them that it is the *drill* which was to blame for their condition. The drill that the men of this Corps do is so little that it can hardly be taken into account. Colonel Davy also refers to the conditions of "soldier's heart," etc., as prevailing very markedly thirty or forty years ago. The position of attention and the whole of the drill was in those days very much more rigid than it is now, and the drill instructor far more insistant on rigidity. It hardly, therefore, follows that the present comparatively easy position of attention, etc. (even thought at times wrongly taken), are the sole, or even the principal causes of the irritable heart and emphysematous condition of the lungs of the present day. Colonel Davy very rightly condemns the holding of the breath and the fixing of the walls of the thorax. Amongst other remedies for this is the judicious employment of breathing exercises under expert supervision. It is only a few years ago that some medical authorities in this country recommended that, when performing breathing exercises, the breath should be held for a few seconds with the lungs inflated to the fullest extent. This is now admitted by all who have studied the subject to have been an error, and a grave one. But because there has been an error in the method of performing these exercises it will, I think, be granted that it is no argument against the correct employment of breathing exercises when occasion arises for their use. The singer takes what is nothing more or less than a correct breathing exercise when, in the words of the lecturer, he "expands his chest to the full extent to contract it again gradually, but immediately, by a correspondingly deep expiration." The good health and vital capacity of the singer is proverbial, and singing is recommended strongly by many medical men for the use of soldiers as well as civilians for the purpose of encouraging full and deep respiration. The Pipers of a Highland regiment are admittedly the men of best physique and greatest staying power, and they, as a rule, have spent some considerable time in every day of their lives from childhood, in taking full inspirations followed by immediate and equally full expirations. It is, too, a mistake to think that the athlete does not practise breathing exercises. Very many athletes practise these exercises as a regular part of their training, and I may mention that at the last Olympic games at Athens it was particularly noticeable that the Swedish athletes (brought up on the Swedish system of physical training, which includes the daily practise of breathing exercises) showed far less signs of distress and recovered themselves far more quickly after the various races in which they took part, than was the case with competitors of other nations. It is, I think, agreed that a mobile thorax is all important. Breathing exercises, performed, as they should be, with full, but not forced inspiration, followed immediately by equally full, but not forced expiration taken in the normal rhythm of breathing according to the individual, improve the mobility of the walls of the thorax more than any other exercise, and put a man into a better state to exchange the carbonic acid in the system for oxygen when occasion requires. As regards such properly regulated breathing exercises, we have the experience of nearly a hundred years in Sweden to justify their employment, besides that of many other Continental nations, and the opinion of a very large proportion of the medical profession in this and other countries. I think that there are many who are not satisfied that the real "blot" on the training is exactly where Colonel Davy would put it, and might I suggest for the consideration of the medical profession, whether the real root of the evil is not the desire to hurry a man's training too much, and to put him to sudden strain and expect

too much of him too soon, and before what should be his careful and progressive training for such work has been properly completed. The cramming of too much work into too short a time, and the sudden calls which are made from time to time on a soldier's endurance before he is fully trained, are an undoubted strain on the immature lad that we so generally get as soldiers. We want, of course, to put our soldiers in the best possible condition of health to undergo the ordinary wear and tear of their life, and the strains of active service, and to derive the fullest benefit from their technical training. And if sufficient time is not given for getting them into this condition, or the work is commenced too suddenly, harmful results are sure to follow. It is certain that a more widely extended knowledge of physiological considerations, as advocated by Colonel Rolt, would very greatly improve the conditions under which men are trained, and it is, I urge, worthy of consideration whether the tending to hurry and interrupt the training before its completion is not responsible for some of the harm.

Colonel G. G. A. Egerton, C.B., Commandant School of Musketry, Hythe :—I do not wish, for various reasons, to join at any length in this discussion. I should like to say a good deal, but I am prevented from doing so. I will, however, venture to offer this contribution. I sent this lecture to one of the leading physiologists in Great Britain, and he returned it to me to-day with this reply :—"I thank you for sending the proof, which I have read with interest. The general contention that respiration is self-regulating has always been maintained by physiologists and the best experts." I take that to mean that he agrees that deep breathing should be self-regulating.

Commander H. D. R. Watson, R.N., Superintendent of Naval Physical Training :—My excuse for making any remarks is that I occupy the position of Superintendent of Physical Training in the Navy, and I think it may interest the meeting to know what we are doing in relation to the matter. The question of gymnastics or physical training in the Navy first received special attention in 1902, after training aloft was dispensed with. It was decided that the Swedish system formed the most logical progressive system, in other words, that it fulfilled the desiderata that Major Moore referred to. This was adopted; but during the past year the Admiralty have not been content with merely adopting a system from a nation; they have decided that it was desirable to enlist the interest and sympathy of the medical officers in the Navy, and with that view they have appointed a surgeon who has personally gone through a practical course of Swedish gymnastics. It is now intended that he shall go round the various training establishments that we have for cadets and boy-ratings, and also endeavour to collect statistics on the lines that Lieut.-Colonel Deane has done. I mention this point because I desire the meeting to understand that the Navy thoroughly realises the imperative necessity of medical officers assisting in the supervision of this work. I venture to think, with Colonel Rolt, that the lecturer has, perhaps, dealt with what was happening three or four years ago, and that the remarks he has made do not apply to either Service in the degree that they did. In conclusion, I would like to tell the meeting that, as regards the system of exercises employed, we do not consider ourselves bound to any nation or system. If the medical officers of my staff, after due experience, recommend a change from the Swedish system, or any other system, it would be carried out, because I do not consider we ought to be bound by what others say, but only by what is sound and applicable to Naval requirements. I would like

to point out, finally, that the two Services are in line as regards the system they have adopted, and that if their medical officers cannot thrash out what is best, I very much doubt if anybody else can.

Lieut.-Colonel F. N. Maude, C.B., Hampshire R.E. (Vols.), late R.E. :—The remarks I intended to make have been largely anticipated by the previous speakers. I would like to ask Colonel Davy, however, whether he can give us in his paper, when it is printed, the date of the order referring to "chest swelling?" I went through all the old drill books in the library upstairs, and I cannot trace such an Order anywhere. I have been in the Service for thirty years, and I cannot remember the order being given. The next point I should like to refer to is, that whilst I was going through these drill books, I also went through the Army Medical Returns, and I found that, going back particularly to twenty or thirty years ago, when the rigidity of the soldier's attitude was carried perhaps to an extreme, in nearly every medical report attention was drawn to the comparative health of the troops in England and the health of the civilians in the country. It was stated that the health of the troops was not worse than that of the average members of the population. That would mean that it was a good deal better than the health of the class from which they were taken, because the average British soldier, when he comes to us, does not come from a well-nourished class, and the death-rate is rather high. It is very difficult to get correct figures on that point; but, judging from the men employed in dockyards and big works, where the work is hard and the exposure is considerable, I think you will find that, on the whole, we do not invalid more men in England between the ages of eighteen and twenty-four, than civilians in the same class of life under equal conditions. I think if we could get statistics with regard to that particular point it would be of enormous help to all the armies of the world. With regard to the question of breathing exercises, Colonel Fox and Major Moore have covered the ground so completely that I have very little to add. Nevertheless, I go so far as to say that the men who introduced drill into the Army, and who laid down the drill practices and the reason for them, never thought, and did not care about the health of the individual. What they thought of was the spirit of the men—whether they were training men to fight who would be able to go in and win. It was not a question of whether the man suffered from heart disease; his life was so short, in the days when they took a battalion into action and, as a general rule, a third were left on the field, that they did not trouble about such elaborate investigations. They thought only of the means by which you could fix the will of a man, and make that will carry along the man in the face of danger and death; and that they did succeed in that there can be no doubt at all. The old British line used to be called at "Attention" as soon as it came under fire, and stand in that position not for the matter of half a minute, but a good deal longer. Even Napoleon's troops, who were not always looked upon as highly disciplined, if they misbehaved themselves were taken out the next time and were ordered to stand under fire as a lesson and a disciplinary punishment. In the same way, quite recently, the Japanese adopted the same principle. I remember in one instance one of their battalions did not distinguish itself quite as much as it might have done; it left an officer behind on the field. They subsequently buried the officer where he fell, and they made that regiment march past the officer's funeral monument every day on its way to duty in the trenches. That is a different kind of spirit altogether to the physiological one we have been discussing. Even if drill does all the harm we are told it does to the physique of the recruit, as long as it will give us men who are physically fit to stand the

strain of the battlefield, that is the vital matter for the nation, and it is for the survival of the nation, not for the survival of the individual that we, as soldiers, are primarily concerned.

Major-General Sir JOHN MOODY, late R.M.L.I. :—I have listened with the greatest interest to the lecture given by Colonel Davy, from which I have learned a great deal. It has also been a privilege to hear Colonel Rolt, Colonel Malcolm Fox and Commander Watson, and the other experts who have taken part in the discussion. I know something about recruiting for the Services generally, but particularly recruiting for the Royal Marines. I recollect that when we measured the men's chests we did not take the maximum and the minimum measurements, but we took the normal. If a man was inclined to expand his chest for the purpose of getting through, the sergeant generally gave him a slap in the stomach, and that brought his chest down at once. So far as our old system of recruit setting-up drill is concerned, I never knew a man who has suffered from it. I was Instructor in Naval Gunnery for nearly three years, and, personally, during which time I carefully noticed the classes of recruits as they came fresh from infantry drill at our Depôt, I never recollect a man who suffered from the effects of the setting-up drill, nor can I call to mind any serious invaliding, yet the only physical drill they had was the old extension motions. I cordially agree with Commander Watson that the more medical officers are associated with the Executive in the training and the development of the recruit, both in the Navy and Army, the better it will be for the Services. There is a point I should like to urge, that in the land forces we take our recruits too young: In many instances lads are accepted on their solemn declaration that they are eighteen years of age, while, certainly in the infantry, the majority of them are not more than sixteen. Such a system is vicious and mischievous, yet it would be easy to ensure that the age on the attestation paper was correct if a birth certificate was obligatory as in the case of large civil employers of labour. The Army Council, being the largest employers of labour in the Kingdom, might follow the civilian example. If the real age was known, as it must with birth certificates, the training would be suited to the real age. The proposal would, if adopted, stop all fraudulent enlistment and materially reduce desertion. We have heard a good deal about the excellence of the new methods of training—including the Swedish drill. I think we should take to heart what Commander Watson urged, namely, that we should not stick to any particular nation's methods; whatever is found to be best for England should be adopted. But if we do adopt Swedish drill it would be only fair to have a Swedish expert at the head of the movement. The lecture has been an exceedingly interesting and instructive one, and the discussion by the previous speakers has been equally so.

Lieut.-Colonel F. A. DAVY, in reply, said:—I am very much afraid that any extempore remarks I shall endeavour to make will fall rather flat after the expert opinion we have been hearing. Necessarily almost, I suppose, the discussion wandered from the point that I raised into mentioning various systems, especially the Swedish. I think I guarded myself against recommending any system; in fact I was not dealing with any system of physical training at all. I was merely anxious to point out a fault in the Army system, and that it was essential not to interfere with normal breathing. Colonel Egerton read a letter from an eminent physiologist, whose views he sought. These exactly fit in with my own, namely, that the less you interfere with normal breathing the better, and that breathing exercises are injurious. May I mention a little more particularly what I should have insisted upon more when I was reading the

paper—that you can train a military horse to do all that you require of it in the way of covering a distance, in the way of increasing its staying and weight-carrying powers, and in teaching it how to do various military movements that you require, without reference to its breathing. You cannot go to a horse and say, "You have got to do this or that with your chest." So let it be with the man. I say that you will improve the powers of both heart and lungs, by judicious general bodily exercise, without any interference, in the case of the man, with his breathing at all. Some remarks have been made to the effect that the military authorities did not authorise any such attitude as that I have been condemning! This book, which I hold in my hand, is an improvement on the Drill Book. But, although it is, I should like to read you what the position of attention is according to this "Syllabus of physical exercises for public elementary schools" in this country. Military matters, in this regard, are supposed to be so well regulated that the education authorities in the country follow the military example. What have we here as regards the position of attention? This: "The body and head must be held erect, chin slightly drawn in, chest expanded." My point has reference to the words "chest expanded." What construction does the drill sergeant put upon the words "chest expanded?" The authorities, in giving these instructions to him, commit the recruit to the discretion of the drill sergeant. Is the drill sergeant always discreet? The only other objectionable part in this position of "Attention" is the direction that the weight of the body must be on the fore part of the feet. That was well dealt with by one of the speakers, who gave a most admirable account of his researches and study with regard to the matter. The point I have been endeavouring to insist upon is this, that the attitude of "Attention" is an attitude of *strain*. Nobody recognises more than I do that military officers cannot address men, much less put them in motion, if they are standing anyhow; there must be attention and uniformity; you cannot have an officer addressing a mob. But you can (as with sailors) have an attitude of due attention without the slightest strain upon the men. That there is strain is acknowledged in this book, where it says, "It should be remembered that the position of attention is one of strain, and scholars should never be kept in it for more than half a minute at a time." In *The Nineteenth Century* of May last, there was an article on the physique of girls, and the author dwelt upon the injury done to girls by the Army drill sergeants employed to drill them. The words were, "Many suffered severely in health, so that the attention of more than one member of Parliament was called to the matter. Finally, Dr. Macnamara, M.P., by a timely expostulation in the House of Commons, was made responsible for the appointment of a Committee on Drill, which resulted in the withdrawal of the Military Drill Book." Have we made things better for the soldier? Not a bit. The same position of strain is insisted on, in spite of this statement that "the position of attention is one of strain and should not be kept up more than half a minute at a time," so bad is it. I say that the order for expansion of the chest, combined with that requiring that the fore part of the feet shall bear the principal part of the weight of the body, tends to make men further swell the chest in order to make it appear as if the fore part of the feet were bearing the weight of the body. Why should that strain be put upon them? I think one of the speakers pointed out that in one corps a plumb-line was used for the purpose of showing how far the chest projected in front of the feet! That is a bad and wrong state of things. The truth lies in the statement made by one of the speakers who adopted my view, that breathing ought not to be interfered with—that it

ought to be left alone. You get full inspiration and expiration when required by exercise without calling the recruit's attention to his breathing at all. It is still the fact that the invaliding returns of the Army shows the circulatory diseases at the head of the list, 739 men having been finally discharged in 1905, as unfit for service on the ground of these complaints alone. Of course, I do not say for a moment that setting-up-drill is the sole cause. I say the waste in the Army is so great that no stone should be left unturned. We should look up every possible cause, and that is why we are here to-day. I wish to insist upon it that cardiac disturbance and emphysema of the lungs are induced inevitably by the means which are adopted, and which are supported in this book—a book which is constructed upon the model of the Military Drill Book. It is an important matter quite apart from the Army, for we largely follow the military model for physical culture throughout the country. In 1904 there were 28,000 recruits, but it appears, from a statement made in Parliament, that 9,000 all but 16, that is about one-third, had disappeared within the year. With a wastage like that, I think the question of how the men are trained, together with the fact that we have a large amount of heart trouble, ought to be considered. Everybody is acquainted with the expression "soldier's heart." Why should soldiers have more heart trouble than other people? I do not see why they should. I was spoken of as being probably not up-to-date in regard to changes in recruit-training at Aldershot, and that is why I thought I would mention to you that this book from which I have quoted is quite a recent edition of the "Syllabus of Physical Exercises," which has been founded on the military model. With regard to Colonel Pollock, it has been said that his material was very much better than the material—or *personnel* would be the right word, I suppose—that we get in the Army.

NOTE.—In the discussion Major Moore objected to the inference I desired to be drawn from the "abounding energy" and high degree of physical fitness of Colonel Pollock's men. While I attributed this result to the fact that Colonel Pollock decided, on my recommendation, to leave the breathing of his men to Nature, Major Moore contended that the Spectator Experimental Company was a *corps d'élite* with which no ordinary company of Army recruits ought to be compared, the latter being, he said, inferior to the former in physique and intelligence. I had insisted that the physical discomfort and distress of chest-swelling led both to invaliding, desertion, and the purchase of discharge; and said that Colonel Pollock had neither invalids nor deserters. Major Moore's contention is that these good results are due to the original fine physique of Colonel Pollock's men. In order to prove to Major Moore that, no matter how fine the recruit is at enlistment, he can be damaged by chest-swelling and converted into an invalid or a deserter (rather than endure the distress), I point him to the Foot-Guards. These specially fine men (at enlistment) furnish the highest invaliding returns for cardiac and pulmonary diseases. Their original fine physique does not save them from the consequences of an evil practice, which is more insisted on in the Guards than it is in the line generally. Surely the inference to be drawn is obvious. If Colonel Pollock's men had been chest-swelled the "abounding energy and "readiness to do more work than was required of them" would not have been there. I asked for a comparative trial, a severe practical test of powers of physical endurance, when Colonel Pollock's men were at Aldershot. It was not thought well to institute it. But let any doubter do chest-swelling for himself, holding, as far as he can, the act of expiration in abeyance as recruits are taught to do (in order to increase their chest-measurement!) and he will soon get rid of his doubts.

That does not alter the fact in the slightest degree that Colonel Pollock could have spoiled his material, by continuing instead of discontinuing (as he did) the breathing exercises. It has been plainly pointed out that if you teach a man to interfere with his breathing (a thing we do naturally, properly, unconsciously, and automatically) you interfere with the heart and lungs. The best test of a man's power of undergoing physical exertion is to be found in the condition of his heart and lungs under that exertion; in the condition of the circulation. One cannot judge of a man's power by simply looking at him. How often do we find that these men who look all right have this heart hypertrophy! I have been very much struck by a thing I have noticed in the newspapers a good deal, namely, the remarks made by coroners when addressing juries in cases of sudden death. They state that when a man has been certified to have died suddenly from the bursting of an aortic aneurism, it nearly always turns out that that man has been known to have served in the Army. These things point to the importance of the question, and the necessity of taking steps, which I am happy to think, from what Colonel Rolt has said are to be taken for the purpose of remedying this evil. It was most cheering to me to hear what he said about the way the matter is now being taken up. If Colonel Pollock, instead of doing the best thing, had done the second best thing, if he had only, say, exempted fifty men instead of exempting the whole from breathing exercises, then a comparison would have been possible between the one fifty and the other fifty. I suggested the exemption of twenty-five because I did not like to ask too much. When Colonel Pollock's men went to Aldershot I was in hopes that something would have been done—that a comparative trial would have been made—but it was not thought necessary. I am sure, however, that if you follow the suggestion in my paper, namely, that the next ten thousand recruits shall be trained without chest swelling, that they shall never be stuck up in this attitude which requires them to interfere with normal breathing, you will find that, if you compare them with the same number of men who have not been so exempted, you will see that the powers of endurance of the former will be very much greater than those of the latter. I took down several other points for reply, but I am afraid you have been kept here very late already. Exercise will bring about due expansion of the

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I should like to add that I do not think Colonel Malcolm Fox's criticism of myself is quite fair, nor is he quite accurate in his facts. To give an instance, he says that "during 45 years I was personally aware of the discharge of 833 men from the Service due to heart trouble." Why, that figure would not represent a fraction of the losses for *one* year. Wishing, it appears so at least, to prove me antiquated, he credits me with holding an important medical appointment at Fort Pitt in 1861, when I was about 14 years of age! But the one important point in the whole matter he does not allude to at all—namely, that 100 men have been recently trained to be soldiers *without breathing exercises*, and were, therefore, capable of work which men trained on the chest-expansion plan are quite unable to accomplish. He seems to think that I have not moved with the times, and makes much of the fact that "breathing exercises are part of the daily routine of our school-choldren," oblivious of the fact that the abolition of these exercises is the very first essential of the modern method—now to be adopted for the Army, and, as a certain consequence, for the schools later. These things take time. The point of the whole argument is that in trying to improve the powers of recruits, we have, instead, been manufacturing wasters by means of injurious methods. It is most difficult to rout out a long prevalent error. I have only succeeded after 30 years.

lungs and improve the physique of the soldier, without his being called upon to stand in an attitude which is shown, and admitted, to be one of strain. We have it officially admitted here in this book that it is an attitude of strain, and all I contend is that we ought to make it an attitude which is not one of strain. I thank you, ladies and gentlemen, for the kind and patient way in which you have listened to me, and I hope and believe that the discussion will have some good results.

The CHAIRMAN (Surgeon-General Sir T. J. Gallwey, K.C.M.G., C.B.) :—This matter has been so thoroughly discussed, both in the lecture, which has been most interesting, and by certain officers here this evening, more especially the officers belonging to the Gymnastic School at Aldershot and by Commander Watson from the Portsmouth Naval College, that I do not think there is any necessity for me to go into the question of breathing exercises. I think we are nearly all agreed that paying great attention to breathing exercises is a mistake. I have visited the Gymnasium at Aldershot recently several times, and they have a system in operation there by means of which the soldiers do not know when they are being exercised in breathing exercises. They are not asked to breathe; they are asked to move their arms, and that is the Swedish system. We have never studied the subject in this country until quite recently, while in foreign countries, where they have the pick of the population for their Army, they have developed it enormously. They have in those countries, with the help of their officers and physiologists, laid down a certain system of training, and a modified system of breathing exercises has been introduced into their training, adopted by the deliberate decision of the foreign experts. Coming to a consideration of the British Army, it must be remembered, in the first place, that we are working with a very immature recruit. The majority of the men who join us are not in good health and they are badly developed. A very striking thing was told me the other day by an expert in this work, because I must take the officials belonging to the gymnastic organisation of the British Army as what you call practical experts: they are practical experts in the same sense that a trainer of a horse is a practical expert in the training of a horse. He said, "The training now being introduced is for the gradual development of the poor class of recruit, and not in any way the training which would be undertaken to make a strong man—the pick of the population—into a football player or a runner." We must be very careful that the physiologist, who lays down the law according to theory, and the practical expert are brought into contact, and that one will not say, "You must not do this," while the other says, "It will be a very good thing." We must discuss this question in committee and test it by experiment, and then probably we will arrive at a good result. The physiologists of this country have never properly considered this question, and it has only been quite recently taken up by Lieut.-Colonel Deane and a few others, while Lieut.-Colonel Davy tell us, in his interesting lecture, that he has been considering it for thirty years. But he has never made himself properly heard. I do not think the blot is on the recruit training, because we are gradually developing a better system of recruit training, but the blot is that continuity of military medical thought is being constantly broken. We take the thing up in snatches only. I hope now that the Army are very much interested in the matter we shall see the subject through, and trust we will be able to develop it thoroughly by the aid of the experts and a Scientific Committee now sitting. I am quite certain that there is at the present moment under the existing system of training a great improvement in the training of the recruit. I have only a few more words to say. The question that

Lieut.-Colonel Maude raised with regard to the civilian heart and the military heart is a very interesting one. You find that a good many of the men who come up for enlistment are rejected because they have bad hearts. We are accused in the Army of manufacturing bad hearts. I think to a certain extent that is so, and the waste in the Army is, perhaps, a test of it, but I am sure many civilians with debilitated hearts enter the Army. If you look at the recent returns on the subject you will find, as helping to prove what Colonel Davy said, that the Foot Guards head the invaliding list. Then come the infantry, then the cavalry, then the Depôts, then the Royal Engineers, and then the Staff and Departments. There is no doubt whatever about it that the Guards are more expert, more alive and more alert in their drill than any other branch of the Army, and that points very much to what Colonel Davy says, that the setting-up drill has a good deal to do with waste from invaliding, although there are no doubt other causes at work. It is exceedingly hard to break down a habit of stiff, chest-swelling drill, and it is only by hammering away and allowing the experts to advise on the subject that we will eventually obtain more progress than we have done at the present time. In conclusion, I beg to propose a hearty vote of thanks to Lieut.-Colonel Davy for the very able lecture he has delivered to-day.

THE NATIVE RACES OF SOUTH AFRICA: FROM A MILITARY POINT OF VIEW.

By Colonel H. B. JEFFREYS, C.B.

Wednesday, 27th March, 1907.

Major-General R. S. S. BADEN-POWELL, C.B., in the Chair.

ORIGIN OF THE TRIBES.

THE aboriginal dwellers in South Africa were Hottentots and Bushmen, but successive waves of invasion by Bantu warriors from Central Africa drove the old inhabitants before them until the situation by the middle of the seventeenth century was that the Bantu invaders had reached the Kei River, latitude about 32°, while the Hottentots only possessed power south of that river, and throughout what is now Western Cape Colony; and the Bushmen were intermingled with the Hottentots, or, in the more northern parts of the country only, maintained a miserable existence amid mountains or deserts.

Little is known of the origin of the Bantu tribes, nor do they ever seem to have existed as a nation; on the contrary not only did they slaughter and enslave the Hottentots and Bushmen, but they carried on incessant warfare among each other.

We have no details as to these inter-tribal struggles, nor would it repay us to attempt an investigation of the native history of South Africa previous to the early part of the nineteenth century, for it was then that the nations with which we are now concerned began to become of importance by reason of their growing military power. The first to emerge from obscurity were the Zulus, under their ferocious king, Chaka, who originated the military organisation for which this people became famous; he was succeeded by Dingaan, and Dingaan by Cetewayo. Moshesh, perhaps the ablest of native rulers, a little later founded the Basuto nation by gradually bringing under his control broken remnants of Bantu tribes, which had been harried by the Zulus; he paid tribute to Chaka and Dingaan.

The Swazis were Zulus who similarly became powerful through the ability of their first chief, Sapusa, and his successors. They are first heard of towards the end of Chaka's reign.

The Matabele were founded by Mosilikatse, a Zulu general, who offended Chaka and fled from his wrath with his whole impi. He ruled over the greater part of the Transvaal until expelled by the

Boers in 1838, when he crossed the Limpopo into what we now call Rhodesia. Lobengula was the son of Mosilikatse.

No other collection of tribes in South Africa merits the name of a nation. The enemy who fought the early settlers of Cape Colony and later engaged our Regular troops (the last Kafir war took place in 1880), were the tribes of mixed descent living near the Kei River on the North-East border of what was then Cape Colony. These tribes were mainly Bantus, but included many Hottentots; they comprised Griquas, Tembus, Pondos, and Fingoes, but were mainly known as Kosas or Kafirs.

The Bechuana tribes again are Bantus, but their military importance is slight, they were harried and indeed nearly exterminated by Mosilikatse and his Zulus, and have no traditions of greatness, and no cohesion; their best known chief is Khama. There are some 125 Bechuana independent chiefs in the Transvaal alone.

Another section of Bantu origin, the Bapedi, will be mentioned later, owing to the military operations conducted by the Boers, and later by us, against their chief, Sekukuni. Numerically they are of small importance.

It will appear from the above summary, that all the tribes with which we have to deal are Bantu by race, except in so far as the Kafirs or Kosas include a proportion of Hottentots; that four tribes or groups of tribes have developed nationality, viz., Matabele, Swazis, Zulus, and Basuto; and that of these four, all but the Basuto are Zulus.

Numbers of Black and White.

We now pass to the consideration of the relative numbers of whites and blacks in South Africa, and in the various colonies into which that sub-continent is divided. This can best be shown by Table "A," from which it will appear that disregarding, as we may, Indians, Chinese, and Malays, we have in South Africa over 4½ millions of natives, and less than one quarter of that number of whites:—

TABLE "A."

Province.	White.	Asiatics and mixed.	Natives.
Cape Colony	580,000	400,000	1,400,000
Orange River Colony	143,000	a few	235,000
Transvaal	300,000	[1]74,000	[2]950,000
Basutoland	a few	—	348,000
Natal	100,000	100,000	[3]950,000
Rhodesia	13,000	2,000	600,000
Bechuanaland	a few.	—	120,000
Totals	1,136,000	576,000	4,603,000

[1] Including 50,000 Chinese.
[2] Including 100,000 labourers from other provinces.
[3] Of these, 200,000 live in Zululand.

N.B.—The number of males between 15 and 60 capable of bearing arms may be taken at a quarter of the population.

Fighting Power of the Black Races.

The fighting power of the various native races must now be dealt with, and an estimate of that power formed after a consideration of their past military history, of their present armament, and of what is known as to their *morale*.

Kosas.—Starting in the South, the Kosas or Kafirs, first claim our attention. All the early Kafir wars were with some section of these people, and the course these wars ran was uniform; they commenced by the murder of isolated settlers, and when the troops reached the scene of action, they took the form of guerilla operations by the natives, attacks on convoys, attempts to surprise the soldiers on the march in bush country, and the like. Occasionally our camps were attacked, but such enterprises involved heavy punishment; never was our superiority contested in the open field. War ended when the natives were tired of losing their cattle, and often when their bravest leaders had been killed. We are practically only concerned with the 700,000 Kosas living in Eastern Cape Colony, between the Kei River and Natal. Our last little wars in this region occurred in 1878 and 1880, when Kosas and Tembus rose against us. Order was restored by the joint action of a small body of Regular infantry and a colonial contingent. A vivid description of the difficulties of these operations, due to the nature of the country rather than to the powers of the enemy, is contained in Sir Evelyn Wood's recently published autobiography.

The neighbourhood to, and intercourse with the dwellers within the border of Basutoland, and the wish to emulate the freedom from interference and the ownership of firearms possessed by the Basuto, will probably, from time to time, produce some effervescence among the Kosas or Kafirs. Such movements will cause the Cape Government anxiety from the necessity of protecting the white settlers, and of restoring order in a somewhat inaccessible part of the country; but these natives are practically unarmed, and as a serious military factor, they can be disregarded.

Basuto, so called from the Lesuto, the country in which they dwell; Balesuto means the people of the Lesuto. In order to estimate the resistance which the Basuto nation could offer to our arms, it will be convenient to review the course of previous wars waged by this people, as narrated by Theal and in the Parliamentary Blue-books of the period; and as they are the only native race with which we have to do, whose possession of firearms is unrestricted, the subject must be treated in some detail.

1852.—General Cathcart, operating from Cape Colony with 2,000 infantry, 500 cavalry, and 2 guns, crossed the Caledon on 20th December, opposite the Platberg, and marched to Thaba Bosigo. Finding the enemy on Berea Mountain, he attacked that position in three coloumns. The first, under Napier, dispersed after cattle, was charged by 700 Basuto horsemen and fell back. The second, under Eyre, gained the summit and captured 30,000 cattle, but was heavily attacked and retired without the cattle. The third column of 300 men, under Cathcart himself, was surrounded by 6,500 natives, but was joined by Eyre and safely extricated. Our loss in this somewhat disastrous affair was only 37 killed and 15 wounded, and Moshesh, the Basuto ruler, though victorious, was so impressed by the steadiness of our infantry, that he offered terms which General Cathcart was

able to accept, with, however, a loss of prestige, of which Moshesh made the most in his communications to other native chiefs.

In 1858, 1865, and 1867, the Basuto were at war with the Orange Free State. In the first war two Burgher columns invaded Basutoland, but the Basuto raided the country behind them and the farmers withdrew to protect their homes. Peace was patched up.

In 1865 the same raiding tactics were pursued, the Basuto penetrating nearly up to Bloemfontein, Winburg, and Kronstadt. Wherever the Boers met their enemy in the open field they easily defeated him, even at odds of 1 to 10. From July to September the Boer forces were attacking Basuto strongholds—they captured Vechtkop and Berea Mountain with small loss, but were repulsed at Thaba Bosigo. As usual they found it difficult to get volunteers for storming parties. They suffered from the weather, there were many desertions, and finally they retired, and the Basuto continued their raids. Peace was made in April, 1866, the Basuto, after long negotiations, agreeing to cede the rich Ladybrand territory.

War broke out again in June, 1867, but Moshesh was now infirm and the Burghers were stronger. Three Basuto mountain fortresses were easily taken, and early in 1868 they were saved by our intervention from the complete disintegration of their country. Basutoland was now administered by the Government of Cape Colony.

In *1879* Morosi's Rebellion occurred; this was a partial affair; the paramount chief did not assist Morosi, whose mountain was taken in November by 300 colonials and 400 friendlies.

1880.—The "Gun War" broke out through an ill-advised attempt of the Cape Government to disarm the Basuto. The Home authorities, advised by Sir Garnet Wolseley, disapproved of this action, and it was consequently arranged that Imperial troops should take no part in the campaign. The war commenced in September, and took the unusual course of attacks on our various residencies, which were hurriedly fortified; none of these were taken, and the natives suffered considerable loss. By November the Cape forces amounted to 10,000 men, white and black auxiliaries. No decisive results were obtained, and when early in 1881 the Basuto chiefs made overtures for peace, a settlement was soon arrived at. As regards arms, it was agreed that the Basuto should retain them but take out licenses; this they have never done.

As a consequence of the failure of the Cape Government to manage Basutoland, this country was taken under the Crown in 1884.

The united Basuto nation can now muster some 50,000 fighting men, all mounted on hardy ponies, and armed with B.L. carbines and rifles, about 10 per cent. of these weapons being small bores. Their stock of ammunition is probably not very plentiful. As regards this point, however, opinions differ; it has been stated by traders in Northern Basutoland that 25 per cent. of the natives have B.L. rifles, and that ample supplies of ammunition are in the country; other and more reliable sources of information lead us to believe that this is a gross exaggeration, and an incident in support of this view is related of a party of 10 Basuto in pursuit of a leopard, who could only muster 1 Snyder rifle and 3 rounds of ammunition between them.

A study of the wars in which they have been engaged, and of which we have given a review, shows that under Moshesh they carried out dashing raids; but even under that able chief, they were easily defeated in the open by one-tenth of their numbers; while in the

defence of their mountain strongholds they showed neither courage nor tenacity, being afraid to show their heads above their breastworks whenever the attackers could bring a covering fire to bear.

It is very doubtful whether the Basuto will produce another leader with the ability of Moshesh, though probably the traditions of his methods of warfare still survive, and we must be prepared for a harassing guerilla contest.

Although of recent years this nation has been courted by ourselves and by the Boers, a state of affairs which, with natives, invariably induces "swollen head," and although the Basuto lately have enjoyed the unedifying spectacle of war between the white races, with its ebb and flow of victory, still, there is nothing to lead us to suppose that man for man these natives are braver than their predecessors of 40 years ago. Indeed, we know that the recent increase in the wealth of the country, due partly to the money which flowed into it during the Boer War, has engendered a condition of luxury and comfort which cannot but discourage warlike enterprise. The Basuto is well off, and he knows it; moreover, the natural features of the country, which cause nine-tenths of the population to inhabit the rich fertile belt, some 20 miles in width, on the western border between the mountains and the Caledon River, place him at the mercy of an invader from the West. The Basuto leaders are sufficiently astute to realise the position, and nothing but dire necessity is likely to cause them to imperil the freedom which they now enjoy.

There is, however, one point for serious consideration, and that is whether the possession by this people of accurate long-range weapons, will, in their mountainous country, add to the difficulty of subduing them in the same measure as in the case of the Afridis. That it will add to our difficulties there can be no doubt. Given equality of armament, the better that armament the more arduous will be found the task of conquering an irregular, undisciplined foe, in a land of rocks. But unlike the Afridi, who delights in solitary sniping expeditions, the traditions of the Basuto point to mass tactics; nor has the individual Basuto the fierce courage of the Indian hillman, nor the fanaticism which Mohammedanism inspires. It is, therefore, apparent that while we cannot neglect this matter of armament in weighing our chances, we must not give undue importance to the probable effect of modern rifles in the hands of such an enemy, especially as that enemy was never distinguished for good shooting, and, at the present time, is known to neglect cultivation of marksmanship.

In proof of this a little known incident of our Boer War may be cited. One of our column commanders in north-eastern Cape Colony had, as he thought, hemmed a Boer commando against the Basuto border, which was here a rocky ridge. Approaching this ridge our men came under a heavy fire, but as it was inaccurate and harmless we attacked and stormed the position, on which the column commander was horrified to find 14 dead Basuto, part of a strong native force placed there to prevent violation of the frontier by the Boers. An Englishman who was with the Basuto force, on receiving the apologies of our column leader, said that the occurrence, though regrettable, was not without value, as showing the Basuto, who had been boasting of their prowess, how easily a

numerically inferior white force could turn them out of a strong position.

There is another cause of Basuto weakness, and this lies in the fact that the nation is really a federation of the followers of seven or eight independent chiefs, who, though owning allegiance to the paramount chief, are by no means inclined to obey his commands without question. Hence, in previous wars we have not found any general concentration of the Basuto forces, but each chief has preferred to operate near his own territory, which it was his object to protect.

Zulus.—Early in the nineteenth century, Chaka, the son of a small chief, was selected through his military prowess to succeed a more important chief. By his valour, his powers of organisation, and his ruthless insistence on absolute obedience, he speedily brought all Zululand and all Natal under his rule. It is stated that during his reign, the population of Natal fell from 100,000 to 10,000. He established the celebrated regiments of young unmarried warriors, and introduced the deadly, broad, stabbing spear, instead of the light throwing assegai.

Chaka was succeeded by his son Dingaan, who treacherously attacked the Boer immigrants and murdered all who fell into his hands. Weenen, the place of weeping, received its name from the massacre there of 41 men, 56 women, 185 children, and a number of coloured servants. Later, 17 English settlers and 1,500 trained blacks from Port Natal, of whom some 400 had muskets, were nearly annihilated by 7,000 Zulus. It was reserved for Andries Pretorius with 460 Boers, to avenge these disasters; by a careful system of scouting and laagering when threatened, Pretorius forced the Zulus to attack him in laager, and on 16th December, 1838 (Dingaan's Day), utterly defeated Dingaan's Army, 10 to 12,000 strong. The Chief Panda was now set up as a rival to Dingaan, who was again defeated and was assassinated while a fugitive. On the death of Panda, in 1872, Cetewayo, his son, became the ruler of Zululand, and it was soon apparent that a contest was inevitable, for Cetewayo restored the military discipline of the time of Chaka, and his young men hungered for war.

The history of that war of 1879 need not be re-told; our disaster at Isandhlawana was largely due to our leaders failing to realise that extended order is not suitable for meeting an enveloping attack by an enemy of great strength and activity, and full of desperate courage; the actions at Ginginhlovu and Kambula, and later the battle of Ulundi, showed that in square or in any close formation our soldiers had nothing to fear from the Zulus. It is estimated that this war cost the Zulus 15,000 warriors, and that the total forces at the disposal of Cetewayo amounted to 50,000.

The events of the recent rebellion in Natal are fresh in our memory. It may be said to have lasted for five months, from the 9th February, 1906. The number of Zulus in arms is estimated at 5,000, and the Colony mobilised some 4,300 men for its defence, including the reserves, who remained in their own districts to reassure the white and overawe the black population. About 2,000 white troops (all Militia or Irregulars) took part in the active operations, which were only brought to a successful termination when Colonel Mackenzie took the risk of sending thin lines of skirmishers through the bush. Against the Zulus of 1879, this audacity would have been severely punished, and, in commenting upon the slaughter of blacks

as compared with the small white loss (32 killed and wounded), this point must be remembered; a successful Zulu rush in the bush was quite possible, and would have entailed a heavy list of white casualties.

The conduct of Dinizulu (the son of Cetewayo) is believed to be still the subject of enquiry by the Natal Government, and, therefore, should not be discussed here, but there can be little doubt but that had that chief given the signal for a general revolt, we should have been confronted by the great mass of the Zulu nation, and that the ranks of the regiments would have been swollen by the return of the young men who are working on the mines or in domestic or public service outside Zululand. We may take the total strength at 60,000; it is possible that 50,000 might have been arrayed against us; but the course of that rebellion showed us that the disarmament of the Zulus has been a very real one, and that fire-arms are scarce. It is estimated that Dinizulu may have 1,000 modern rifles concealed near his kraal, possibly there are 4,000 or 5,000 old guns in the country; certainly ammunition is scarce, and equally certainly the Zulus, who might handle those rifles and guns, have no skill in their use.

Dinizulu was in no state to head a rebellion, suffering as he is believed to be from a mortal disease; besides, it is very probable that he knows the inevitable result of any such attempt. But the rising was of interest as showing how the surrounding chiefs hung upon Dinizulu's word, and how, whatever we may do to break up the nation, the old traditions still survive, with the spirit of nationality and devotion to the representative of the line of warrior kings. It has enabled us, too, to form some estimate of the military value of the Zulu warrior of to-day, and it cannot be denied that he has deteriorated. Though still organised by companies, the old regiments have gone, and the organisation of young unmarried men; gone, too, is the power of the chief to put to death all those who turned from the foe. In their place we have a boasting spirit and a general condition of bumptiousness among the young Zulus, due partly to the mildness of our rule, partly to the preaching of the Ethiopian doctrine of equality of black and white, and partly to loss of white prestige arising from the contact of Zulu ricksha boys, labourers, and servants with the white trash of the towns. Such changes do not conduce to valour, and it is not surprising that the braggarts and vapourers who lately rose in rebellion failed to display that desperate courage which alone can bring the spearman within reach of the soldier with his magazine rifle. There is no reason to suppose that the Zulu warrior will not gradually still further deteriorate under the influences of civilisation and of the *Pax Britannica*.

Swazis.—The Swazis appear to have risen to power during Chaka's reign; they owe their name to Umswazi, the son of Sapusa, the founder of their nation. They have enjoyed a great reputation as fighters, and have furnished contingents on several occasions to assist the Boers against other native tribes. Sir Garnet Wolseley, in 1879, employed 8,000 Swazis in his operations against Sekukuni, and their conduct when storming that chief's stronghold was well spoken of.

Curiously enough, the Swazis have never fought against the white man. They are believed to have but few firearms.

Sekukuni.—This chief rules over some 25,000 of the Bapedi branch of the Bantu family; his country lies north of Lydenberg and south-east

of Pietersberg, and includes in its area some mountain fastnesses very difficult of access. This fact explains the escape of the tribe from destruction at the hands of Mosilikatse from the south-west and of the Swazis from the east.

Sekukuni's people gave the Boers some trouble, and, indeed, repelled several attempts to capture their stronghold.[1] Sir Garnet Wolseley, however, after the Zulu War, had no difficulty in carrying this operation to a successful termination.

This tribe is of but slight military importance. The same remark applies to the many other chiefs scattered through the Northern Transvaal and in Bechuanaland. Operations against some of them would be difficult and tedious on account of the inaccessibility of the country, but once brought to action their defeat would be easy, for their fighting value is but slight.

Matabele.—It has been said already that this section of the Zulu nation owes its existence to Mosilikatse, the warrior who, with his whole impi, fled into the Transvaal to escape the wrath of Chaka. Mosilikatse and his men applied the Zulu methods to the country he traversed, and soon enslaved all the Bantu tribes which he did not exterminate. The ruined remains of vast kraals now found in the Transvaal and in the more accessible parts of Bechuanaland are probably evidences of Matabele operations. The early Boer trekkers soon came into collision with Mosilikatse, and several desperate encounters resulted, until finally, in 1838, 135 farmers, under Potgieter, with some native allies, engaged the Matabele army, 12,000 strong, for nine successive days, and drove it headlong over the Magaliesberg. Zilicats Nek owes its name to being the place where the Matabele crossed. Mosilikatse did not stop till he had put the Limpopo between himself and the Boers; north of that river he established his kingdom.

We next came into contact with the Matabele through the occupation of their country by the British South Africa Company. Lobengula, the son of Mosilikatse, was the native chief, and appears to have tried to avoid war. However, his hand was forced by the young warriors, and hostilities broke out in 1893. The native force numbered some 20,000 men, with a considerable number of firearms, in the use of which, however, no great skill was displayed. Against this force Dr. Jameson took the field with two columns, 650 and 450 strong. The former column was twice attacked on the Shangani River by 5,000 or 6,000 natives, who were beaten off with great slaughter. Lobengula took to flight and died shortly afterwards. Alan Wilson's patrol only numbered 34, and was cut off from succour by the rising of the river. The other casualties, in addition to the above 34, only numbered 19.

Rebellion broke out in Matabeleland in March, 1896, and spread to Mashonaland in June. About 15,000 natives in each country were in arms against us. Of the Matabele, some 2,000 had Martinis; 100 police deserted with their Winchester repeaters; others had Lee-Metfords or sporting rifles; others, again, old muzzle-loaders.

The Mashonas were worse armed, and had few rifles but a good many "family" guns, as they were called, shooting anything from slugs and bits of wire to Worcester Sauce bottle stoppers.

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[1] A hill called "Fighting Kopje" in the Lulu Mountains

150 white people were murdered at the outset in Matabeleland and over 100 in Mashonaland. We put into the field 3,000 men in the former and 2,000 in the latter country. As was expected, the Matabele proved the better fighters, and kept some of our small columns pretty busy; they resisted stubbornly, too, in their mountain strongholds.

Against the Mashonas, nearly all our losses were incurred at very close quarters in attempting to get at natives in caves; generally, the "family gun" was responsible. We had killed in action and died of wounds, 51 in Matabeleland and 19 in Mashonaland. The rebellion was not subdued until December.

Native Combinations.

We have now described the principal native races with whom we have to do: their origin, history, numbers, and strength. It remains to consider what prospect there is of their ever combining in a gigantic race war—4½ millions of natives against 1⅛ millions of whites.

That this problem exercises the minds of many well-informed people is undeniable; we had abundant evidences of the fact during the late troubles in Natal, in the utterances of the public Press, in the speeches of public people, and in addresses of public bodies to the Government. As an instance of the strange and unreasonable dread with which some people regarded the matter, one of the stories which gained some credence in Johannesburg was that 20,000 Basuto horsemen were coming to capture that town; and this in the face of 6,000 volunteers, many of them of first-rate quality, not to mention the strong Regular garrison of Pretoria. Therefore, it is not a problem to be scornfully dismissed, yet it is difficult to see what solid grounds there are for anticipating, now or in any but the distant future, any close union or combined action of the native races.

Take the tribes of Zulu origin: the Matabele were fugitives from Chaka; Swazis and Zulus have always fought, and the Swazis stood aside while we broke the power of Cetewayo, afterwards aiding us in the operations against Sekukuni. Moshesh formed the Basuto nation in fear and trembling of the Zulus, whom he had to bribe into acquiescence. And in none of the Basuto wars against the Dutch did they receive any Zulu help, except from a few dwellers on the border.

There is no common history, tradition of nationality, or strong religious sentiment to unite the Bantu tribes, which within historic times have always preyed upon each other.

It is undeniable that Zulu emissaries before the rebellion in Natal were passing, with or without the knowledge of Dinizulu, from Zululand into Basutoland (probably only to the border chiefs), into Swaziland, and into the Northern Transvaal, and that they were preaching union against the white man; but their mission was an absolute failure. The Basuto are contented, and have all the freedom they desire; they are unlikely to risk the loss of it. The other tribes which are more directly under our governance have their grievances, no doubt, mainly connected with taxation and the land question, but they are suspicious of each other, and natives have a fortunate and ineradicable tendency to await results before committing themselves.

The one element that makes for union, and is therefore a danger to us, is Ethiopianism, or the doctrine imported from America, under the guise of Christianity, of equality of black and white. It is difficult to say how far this doctrine has permeated, but it is believed to be making way, and the ground will undoubtedly be prepared for its reception by the spread of education, which we cannot wish to check, by dissatisfaction at the position of the native as regards voting power and inability to own land, and by the natural and laudable wish of the educated black man to rise in the world.

These various tendencies will afford the rulers of South Africa in the future much practice in the solution of difficult problems, but they are not likely to lead to a big native war. The Christianising and civilising of the black man amid conditions of profound peace are not calculated to arouse the warrior spirit within him, which spirit he has already in a great measure lost; nor will these influences develop fanaticism—that power which has strengthened native arms against us in many countries, but which is happily not found in South Africa.

Those who hold strongly by the theory of the native peril, sometimes quote the Indian Mutiny and the amazing union there displayed of Hindoo and Mahomedan against the common enemy. But they forget that this great rising was primarily a military rebellion, brought about by mistakes in administration, and facilitated by our foolishness in maintaining in India over 200,000 native soldiers, while our white Army had been allowed to dwindle to 35,000. Added to this, we had a recent annexation of provinces and abolition of an old and once powerful monarchy; and, moreover, we had to deal with people who had been warring with civilised arms against each other and against us for 100 years, and had, therefore, not lost their martial spirit. The condition of South Africa in 1907, as regards the native question, can truly in no way be compared to that of India in 1857.

White Forces Available.

Now, what are the white forces available to put down any native rebellion? Omitting the Regular Imperial Army, as its reduction or withdrawal is always possible, we have:—

Cape Local Forces	8,000
Transvaal Volunteers	6,500
Natal Militia	3,500

And behind them, practically as many men as the Governments concerned may care to arm and put into the field, for there are no politics where the black question is involved; 20,000 or 30,000 volunteers could easily be raised on an emergency, and the arms and ammunition for them are in the country.

Rate of Native Increase.

We have seen that there are now some 4½ millions of natives in South Africa; what that number may amount to in the future is a serious consideration.

Natives are very prolific, and, owing to their habit of polygamy, few of the women remain unmarried. In the past the constant savage wars of extermination kept the population down. We have seen how Chaka reduced the inhabitants of Natal from 100,000 to 10,000, added to which the ravages of famine and pestilence often swept away thousands.

Wars and famines we have stopped, and pestilence we fight not unsuccessfully, consequently we may expect the native population to increase very rapidly.

The following figures are instructive:—

Province.	Native population in		
	1880.	1891.	1902.
Cape Colony	—	1,066,000	1,424,000
Natal	362,000	628,000	900,000
Transvaal and Swaziland ..	—	750,000	1,000,000
Orange River Colony	79,000	129,000	235,000
Basutoland	128,000	219,000	347,000

It is evident that the problem of the respective parts to be played in the government and in the life generally of South Africa by white men and by black men will not become easier in the future. We must be content to leave the solution of this problem to the generation whom it will most concern—our sons and grandsons may be.

White Forces Required.

The time at our disposal is limited, and I have trespassed on your patience long enough, but before concluding there is one question which will occur to you, and which must be answered, and that is: What is the proportion of whites to blacks necessary to put into the field in case of a rebellion? It would take too long, even were if desirable on other grounds, to enter into the probable course of military operations in any of the eventualities which we have been discussing; therefore we can only deal with this subject in general terms. How comes it that if 135 Dutch farmers with some native allies could route 12,000 Matabele, and if 460 Boers could defeat a similar force of Dingaan's Zulus, the Natal Government thought it necessary to mobilise 4,300 men against 5,000 natives? And in this last case the white troops had magazine rifles, as compared with the elephant guns of the early trekkers, whereas the Zulus in 1906 still depended upon the assegai. There are two reasons for this apparent anomaly. In the first place, we are more tender of human life now than formerly, partly owing to our—as far as the nervous system is concerned—perhaps excessive civilisation, and partly on account of the popular Press. Fifty years ago a family of settlers in a remote colony might be murdered, and it is doubtful if an account of the occurrence would have found its way to the papers. Now the news of such an atrocity would be wired all over the world, and hysterical editors would be calling for the downfall of a Government under which such things were possible. Hence the necessity for elaborate measures to safeguard the widely scattered white rural population, and the employment, as lately in Natal, of more than half the troops for this purpose. The second reason lies in the nature of the warfare to be carried out. Pretorious and his 460 led Dingaan to attack him laagered behind his wagons in an angle of the Blood River; Potgieter and his 135 were mounted, and the Matabele could not touch them on the open plains of

the Transvaal. If we should in the future be obliged to carry out military operations against any of the native races in South Africa, we have only to steer between the Scylla of over-confidence and the Charybdis of an exaggerated idea of native prowess. To enter the almost impenetrable fastnesses of Zululand, such as the Nkandla Forest, or to press a Basuto war to its conclusion among the mountains in the interior of that country, would require columns of considerable strength, but to defeat any native force in the open field should be in the future as in the past an easy task for a well-armed white force of one-tenth the native strength.

Conclusion.

Briefly, then, the situation is this: No combination of the black nations for a gigantic race war is in any degree probable. Were such a contingency to arise, isolated murders of settlers' families would occur, but owing to the impossibility of unity of action among the natives, they would easily be beaten in detail. The best fighters are the Zulus, but they are not the men of 1879. The most powerful tribe are the Basuto by reason of their numbers and of their armament, but they are not formidable away from their mountains, and with the increase of material comfort they are becoming less warlike. And, finally, we may confidently predict that the native question of the future will be settled by ministers, not by generals—in the council chamber, not on the field of battle.

In venturing to record this opinion, I may be considered unduly optimistic, for it cannot be denied that some well-informed people, who have had exceptional opportunities of studying native life and character, hold that the black peril is looming large in the not far distance; but I am unable to take this view. It is for you to say whether the line of reasoning to which you have listened this afternoon justifies my optimism.

Colonel E. S. C. Pemberton, R.E.:—Having served with Colonel Jeffreys in South Africa, and recently been through Basutoland, I have listened with much interest to the paper which he has just read. The conclusion arrived at by him "That the native question of the future will be settled by Ministers, not by Generals—in the Council Chamber, not on the field of battle"—is one with which I am in agreement. In the course of somewhat extensive travels throughout the Sub-Continent, it has been my good fortune to hear the views on the native question of many Colonists, missionaries and magistrates connected with native administration, and I certainly think that the progress which has been made since I first knew South Africa in 1881, is remarkable in every way. I agree, too, with the opinion of the lecturer that the tendency of such progress and education, coupled with the acquisition of comparative wealth by the natives, has been to diminish the martial spirit of the races generally, and that this is especially so in the case of the Basutos, who inhabit a rich country and enjoy a high degree of well being and prosperity. Colonel Jeffreys says, "I think it behoves us to take any measures that may be necessary as a matter of precaution," but he does not tell us what they should be. Personally, I think the construction of roads through Zululand, especially through the Nkandhla forest district, which was the scene of fighting in the recent rebellion, would be calculated to prevent a rising in that country in future, or, if one took place, would enable us to deal effectively with it.

Similarly, the bridging of the rivers in Basutoland, where they are crossed by the main and only wagon road in the country, appears desirable in view of the fact that these often become flooded in the rainy season, when traffic across them is stopped for days at a time. Such conditions would impede military operations, rendering combined movements impossible of execution. The lecturer looks to the settlement of the native question in the future. Would it not be truer to say that the native question in South Africa will never be settled? that it will always be in course of settlement, as it is, indeed, at this moment? Now, a few years ago a Commission, known as the South African Native Affairs Commission, was appointed as the result of this resolution passed at the Customs Conference, held at Bloemfontein in March, 1903:—"That in view of the coming Federation of South African Colonies it is desirable that a South African Commission be constituted to gather accurate information on certain affairs relating to the natives and native administration, and to offer recommendations to the several Governments concerned with the object of arriving at a common understanding on questions of native policy. Such Commission to consist of two representatives from each of the Colonies and one each from Rhodesia and Basutoland, with the addition of a Chairman to be nominated by the High Commissioner." Well, the Commission, which was composed exclusively of gentlemen possessing experience of the natives and a knowledge of the native character, sat during the years 1903-5, travelled through the length and breadth of the land, and took a great deal of evidence. Their report, which was in the main endorsed by public opinion in South Africa, and a copy of which is to be found in the library of the Royal Colonial Institute, lays down certain broad principles, and it is on these lines that future native legislation will doubtless be largely based. Meanwhile we may look for a steady improvement in the position of the native, though in this native question great patience will have to be exercised, but, if this be shown and interference from home cease, there need be little fear of an organised armed rising on a large scale of the natives in South Africa.

Should a rising take place, however, within the confines of the Colonies, it will be promptly and effectively dealt with by the Confederation, which will then have come into existence. On the other hand, any rising in the Bechuanaland Protectorate, in Swaziland, or in Basutoland, would be a matter for the Imperial Government to deal with—the local governments having no responsibility in connection with the administration of these native territories.

Mr. Claude A. Bettington, South African Light Horse:—There is one remark I should like to make in connection with Colonel Jeffreys' statements about the Basutos. As far as I understand there are some 30,000 mounted Basutos, in addition to their infantry, and that the great weakness of the native is that he is not able to get up to European troops and fight hand to hand with them, which is his only chance, on account of his obsolete weapons. I think we lose sight of the fact, however, that these Basutos are all well mounted, and that if they get a favourable opportunity they will charge in the open, and if they once get home we should have to have a very much larger proportion of whites to meet them, than in the contrary event. I have seen mounted Basutos armed with a rifle and a kerri (knobstick), charge home, and use the latter with marked effect. I think that is a danger we must always bear in mind. During the late Boer War the Basuto "Scouts" learned a great deal, and, furthermore, appreciated several of the weak points of white troops. Then we have to bear in mind

the fact that new generations of natives are constantly springing up—natives who have not come in contact or fought with the white man, and the old chiefs cannot persuade them that it is useless to rise and murder the whites. The young bloods become indolent and cheeky, and have to be taught by bitter experience. I think the Basutos are a greater danger to the neighbouring Colonies than Colonel Jeffreys thinks, and, in my humble opinion, it is a danger we must not lose sight of. As regards the remainder of the native tribes, and the statement that a combined rising of the whole of them may take place, I do not think that is a thing we may have to consider. They are too scattered for united effort. Furthermore, all native tribes are not in sufficient sympathy with one another. As regards Ethiopianism, it is nothing less than a terrible sin: it should be debarred altogether, and made a criminal offence in South Africa. To tell a black man that he is as good as a white is absurd, because he is not educated sufficiently to understand the difference. I do wish the people who go to Exeter Hall would realise what a lot of harm they do by encouraging this Ethiopianism. These good people should leave South African affairs to the man on the spot, who understands them. The white inhabitants of Southern Africa are not barbarians, or of any more brutal tendencies than these self-elected protectors of our black "brethren," of whom, from the way they go on, it is almost safe to say they know very little.

Major H. Mitchell, late R.A.M.C.:—Colonel Jeffreys has told us that we have at present very little to fear from any rising on any great scale of the natives in South Africa, but he has also told us that as their occupations are of a peaceful nature they may be expected to increase in numbers very largely in the immediate future. If these fighting races, such as the Basutos and the Zulus are, and have been for generations, have no more fighting to do, at least we hope not against us, I think we should try and turn the fighting instincts they possess into channels which will be of some use to the Empire, at any rate, that portion of the Empire in which they live. It seems to me it is a very great danger if a powerful and fighting nation has nothing to do. I believe they are not hard-working as agriculturists, that they exact from their womenfolk the greater portion of the work that is done, they being content to sit still and look after their cattle. Formerly they looked after other people's cattle; but now, I presume, they will have to confine their attention to looking after their own. That is a very dull occupation, and I think if we could in any practical manner enlist the services of these very fine men, either as Militia, or as Yeomanry, or as troops of an irregular nature, settling them at the same time in the possession of their land, on which a minimum of cultivation is required, and requiring them to give their spare time to a well-organised military service, it would be of very great advantage to the country. Such troops could not very well be employed against white races, but there may be troubles either farther North or in the centre of Africa, in connection with which they might be usefully employed. At any rate, I think there is a danger in the present state of things, because a large and fine population is existing in a state of idleness and no longer permitted to fight—their chief instinct. Some arrangement on those lines might be, I think, hopefully looked for, and I venture to suggest such a thing for your consideration, on lines similar to the West India Regiment in Jamaica, or the Sepoy Army in India.

The Chairman (Major-General R. S. S. Baden-Powell, C.B.):—I think the importance cannot be exaggerated of this question being duly

considered and understood by the people at home. It is one which we cannot well compare with what has gone before in any other country, and, therefore, special measures are needed to deal with it—I refer to the steady increase of a native race prone to warfare or to fighting, and which is gradually improving in education, and coming under the influence of educated native agitators in connection with this Ethiopian movement. We have learnt a good deal about the different races in South Africa through the medium of the paper we have just heard. I should like to add one little point about the Basutos which the lecturer did not touch upon. You may remember that in former wars against the Basutos, the 12th Lancers and the 7th Dragoon Guards were engaged. In those days the troops wore the usual uniform and helmet, instead of the khaki and the mushroom hat we are accustomed to wearing nowadays. At the end of the war, the Basutos came in and talked over the settlement with our people. They said to us, "We have had a good fight. Good-bye. But next time you come to fight us do not bring the Lancers; we do not like them—not on account of the lances, but on account of their hats. The brass helmets of the Dragoons were the ones we liked best, because after we had killed a man we could stick his helmet in the ground by its spike, cut his heart out, put it inside, light a fire round it, and thus cook it easily." That is the sort of spirit in which they left off fighting in those days, and that is just the sort of spirit they have now. They would be quite willing to fight without any particular cause, and without thinking of the results; that has always to be taken into consideration. They are just like children; they are suddenly moved by the storm of passion, which breaks out for no reason, simply because they are unsettled. They do not care about results till the results come. There is a very great problem looming before us in the future, in the steady increase of a fighting population that is not inclined to do any work. We have got an example of it in Natal. The natives have been put into reserves, where they are not interfered with by white men; they simply increase and multiply at an enormous rate, and will not do a stroke of work. The men lie on their blankets all day, and are open to any influence, good or bad, that comes along—preferably the bad. You cannot get them to go and work in the mines in any large proportion; but if an Ethiopian-movement-man comes along, he finds willing ears to preach to, and no counter-acting influence to opposition. It is quite different from the state of things in America. There, when the Red Indians are put in reserves, they gradually decrease and die out. In South Africa they increase every day. Major Mitchell has referred to the idea of utilising some of that waste material for troops. No doubt there is a very great deal in that idea, but, at the same time, it must not be overlooked that there are great local objections to it on the part of the Colonists themselves. They do not like these black people being taught modern soldiering, for fear that difficulties may occur with them any day. Major Mitchell has referred to the possibility of utilising their services elsewhere. There is no doubt of their being first-rate material for soldiers if they are drilled and used against an enemy in the field; they might possibly be of valuable service up in East Africa, where we now have four battalions, or in West Africa, where we have a good number of troops also; but there is that danger of using them in their own country, that they might rise against us at any time. Personally, I do not believe so much in that danger as some people do, because once natives are brought up to follow white men, and to use white men's tactics, they are quite at sea when they come to try them on their own account. Still, there exsts that apprehension in the Colony, and we

must not ignore it. In dealing with the future, I feel that the main point is to leave it to the men on the spot to determine how things ought to be carried out, because out in that country there are men who have spent their lives among the natives, and who thoroughly understand them from A to Z. It is much better that they should settle the matter for themselves, rather than that we should deal with it from the great Hall in the Strand, or anywhere else. That we should all take an intelligent interest in the question is only the right thing, so that we can be able to back up the voices that we hear from South Africa, when such matters have to be dealt with over here in Parliament. An Englishman does not, as many of us seem to think, change his character because he goes to live in a Colony. Far from it; he retains not only his good points, but his bad ones also. He is just as wanting out there in principles of economy as he is at home. When the time comes we throw money away like water, and do not really economise in slack times. I have been out to South Africa on three different occasions in connection with native outbreaks, and it has always been the same thing. A sudden outbreak has occurred, for hardly any reason whatever, in some distant part of the Colony; farmers, in scattered farms, are murdered right and left; then the troops are brought out, after a certain amount of delay in getting together transport and all those things, and the natives are crushed by severe defeats. All that expense of life and money might be avoided, or to a very large extent avoided, if people would only practise the economy and pay the insurance against such outbreaks. They do not care to keep up a sufficient force of police in peace-time as a rule, and I believe that a good policing is the very best, if not the only, preventative. You can always *cure* a native outbreak by treading on it with sufficient force and consequent expense, but the important point is to *prevent* it. That is easy to do if you keep up a sufficiency of constabulary. You only want two or three men in small fortified posts about the country to keep a watch on the natives, and the moment there is the slightest outbreak—the moment a man refuses to pay his hut tax, you jump on him at once—the spark is trampled out directly it appears, and the thing is done. I know from experience that at least four native outbreaks since the war have been stopped in that way by the police. There may have been some since I left the country, because one does not hear of these very small affairs when they are stamped out at once.[1] But if they are left unnoticed for a few days, the spirit of disaffection spreads like wild-fire amongst the natives; it goes from village to village; the people talk it over among themselves, the story gets exaggerated to an enormous extent, and in no time they are all up in arms. It takes weeks to get the troops up; in the meantime the fire is spreading right and left, and white people are being murdered. You want constabulary on the spot to deal with such outbreaks, and therefore, it is well worth the expenditure in keeping up the constabulary in peace time, because in the end it may, and in South Africa most probably will, save the cost of a big expedition. Then outlying farmers should be persuaded to make for themselves at least one defensible building when they are building their farms. The Government of East Africa are now taking that point up; I believe they do not allow a man to have a farm unless he provides himself with a properly defensible building. Once the natives know

[1] Since the above lecture the reports have been received of the very prompt repression of what would have undoubtedly been a dangerous outbreak on the part of some natives, by a very plucky, quick-witted act of a few men of the South African Constabulary.

a man is in a safe building which is not likely to fall at the first assault, they will not attack him. I knew one man who only had an old water-tank for his defence; he got inside it, shut the lid, and was all right. The natives would not attack him; they left him alone, and went on to some other people, who were not so well prepared, and murdered them. The subject of this paper is one which has not been sufficiently considered in the past by people in England. The suggestions that come from the Colonies are often not thoroughly understood at home, and not reasonably backed up when they come before the legislators of this country. I think we are very much indebted to the lecturer for bringing forward this important subject this afternoon, and I propose that a hearty vote of thanks be given to him for the interesting manner in which he has placed the matter before us to-day.

Colonel H. B. Jeffreys, in reply, said:—There are one or two questions I should like to answer in reply. Colonel Pemberton referred to the making of roads and means of communication. Nothing can be more admirable as a means of giving greater power to an army than improved roads and means of communication, but we have to be very careful. The natives are very jealous of an interference, and we do not want to arouse their susceptibilities. What we try to do with the Basutos is to leave them alone. If we leave them alone with some measure of freedom we shall have no trouble, but once we try to interfere with them, by making roads against their will with a view to military operations, there is quite a chance that trouble will ensue. With regard to the subject of the eventual settlement of the native question, I did not presume to deal with that. It is a very difficult problem, and I am quite content to leave that as one of those questions to be worked out in the future. I was only trying in my lecture to deal with the military situation as it now arises. Mr. Bettington thought I rather under-rated the power of the Basutos with regard to charging in the open. On that point I would only ask him to read a History of the Wars. Go through any account you can get, and you find that even against troops who were only armed with muzzle loaders, they never got home; they never did any harm with their charging tactics. They charged up in masses, but wasted away. The fact that they have rifles will give them more power in their mountains, but it will hardly affect their fighting on horseback. It takes a great deal of training and skill to make a man efficient with his rifle on horseback. The Boers did a lot of fair shooting at a close range on horseback, but I do not think the Basutos will. I do not think they are very much to be feared, should they attempt mounted mass tactics against British leaders. Major Mitchell's question with regard to the employment of natives as soldiers has been dealt with by our Chairman, and I can vouchsafe for the accuracy of the Chairman's views. I was talking to a Minister in Natal on that very question recently, and he said the people would not hear of it. The people of Natal are dead against doing anything which will foster the military spirit amongst the natives, because they look on it as a danger. So that I think we shall have to find some other means of employing the natives. We wish that they would all adopt peaceful employment, but the natives will not work, and our Home Government is very much against any idea of increasing their taxation with a view to making them work. That is one of the difficulties of the problem.

THE PASSAGE OF RIVERS BY SMALL BODIES OF MOUNTED TROOPS.

By Captain E. N. MOZLEY, R.E.

Continued from August JOURNAL, p. 1023.

It was found in South Africa that head-ropes of horses were invaluable for packing pumps, which got out of order. No doubt head-ropes would be equally useful for rafts. The rope must be unwoven, and, if possible, greased, and then forced into the joints.

Under the second division of rafts, *i.e.*, those composed of closed vessels, we must now describe the use of hides of animals. This is probably one of the oldest methods of making a raft, and is described by many early writers. Xenophon states that the Greek Army crossed the Euphrates on rafts formed of skins stuffed with hay. Alexander the Great adopted this expedient to cross the Oxus; Livy relates that some of Hannibal's Spanish Infantry passed the Rhone by swimming with the assistance of inflated leather bags; and Cæsar mentions that the Spanish and Portuguese Light Infantry were in the habit of crossing rivers in this manner. It is constantlv used by Cossacks at the present day. The Austrian Army has an equipment of "Schwimmsacke," *i.e.*, bladders, which are carried by the Cavalry Pioneers, and can be inflated. The skins of most animals can be used, but of course the larger the animal, the less work, proportionally to the buoyancy attained, will have to be done in skinning them, sewing them up, etc. In the case of mounted troops, whose needs we are considering, horses will generally be the animals concerned, and the use of their hides will alone be treated of here. It has often been necessary on service to sacrifice sound and healthy animals for this purpose; as, however, one horse-hide filled with air will safely float for several hours four men, and can, of course, take several journeys, only a small portion of the force will have to be dismounted for this purpose.

As regards skinning a horse, a good method is to cut a slit from the sheath to the root of the tail, and then to pull the skin forward over the head.[1]

[1] Sir Howard Douglas gives an account of the following experiment made with an oxhide, trimmed into a circular shape about 5 feet 6 inches diameter :—The skin was drawn together at the edge, and firmly bound round a tube made of alder tree, having the pith removed; a piece of leather was nailed upon the inner end, as a valve to prevent the air from escaping. The vessel was inflated by a common hand-pump, and floated 300 lbs., and without any application to close the pores of the skin, remained nearly fully inflated for five hours; at the end of twenty-four hours it was still found capable of floating 150 lbs.

The sheath dock and neck must then be sewn up, which can be done by a collar maker. The remaining four orifices, *i.e.*, the legs, can either be sewn up or plugged by inserting cylindrical pieces of wood into the legs and tying tightly round the wood with wire.

The hides may be stuffed either with air or with some light substance, such as heather, hay or fern; air gives much greater buoyancy for a few hours, but is very liable to leakage; the other method gives less buoyancy, but retains it much better than air. Indeed, it would be more correct to look on hides stuffed with heather, not as closed vessels, but as solids, possessing inherent buoyancy of their own, and therefore coming under the third method of raft making. For a hide so stuffed will do its work even though leaking in all directions.

To fill a hide with air, a pump, which is almost always carried for water supply by the smallest isolated parties, may be used. One orifice, which should be a leg hole, is left open, and the delivery hose of the pump inserted into it. The orifice must be kept well under the surface of the water whilst pumping (as much as a foot if possible), or the air may not enter the hide; when the hide is as full as possible, the hose may be withdrawn, and the orifice closed with a plug, as before described, the hole being kept well under water until it is sealed.

No such elaborate precautions are necessary when filling a hide with heather, etc. It would, of course, be filled through the largest orifice, *i.e.*, the neck, and, when sufficient material is inside to stretch the hide to its utmost, the hole is sewn up. It is very important to pack the hide very tightly, and to compress the packing material, as the latter shrinks greatly when it gets wet, as it is sure to do.

It is worthy of note that small air holes or leaks in an old hide may be stopped efficiently with round splinters of wood. The hides of all animals are more liable to leak along the back than elsewhere, and therefore special attention should be paid to that part. Salt or solution of gum may be rubbed well in. Four horse-hides make a very good raft, and have supported, inclusive of superstructure, 2,560 lbs., with the hides almost entirely immersed. (In the case quoted two hides were filled with air and two with fern.) The Bengal Cavalry have used lances secured with headropes as superstructure. They made the rafts 6 to 9 feet square, composed of 4 to 8 "mussocks," 20 or 30 lances, and a dozen head-ropes. The lance heads should be arranged so as to be on two sides only.

Raw hides (which would be, of course, most commonly used) contain air longer than tanned hides, but are, it need hardly be said, unpleasant to handle in hot weather.

Our third heading, into which we have divided improvised rafts, includes those which have natural buoyancy, *i.e.*, such as are not affected by leakage. There are two kinds of rafts for which these conditions hold good: *a.* timber; *b.* covers or skins stuffed with light material. The construction of timber rafts, lightly dealt with in the official text-book, is nowhere so well carried out as in the Canadian backwoods. In building their rafts, the shanty-men make great use of twisted ropes of cedar and birch bark, and of hardwood treenails for fastenings. The raft is usually made in the form of a square crate of considerable depth, and the interior space is filled in with light wood, such as cedar. When lashings are used they are

made of chain, passing through auger holes at least 18 inches from the ends of the logs. Wire from the hay trusses is used when it can be got.

The following method of launching and connecting logs into rafts simultaneously, is of interest. The logs are laid parallel to and close to the bank one behind the other (alternate butts and tips), in the order they are to be in when in raft. The first is then rolled into

Fig. 7.

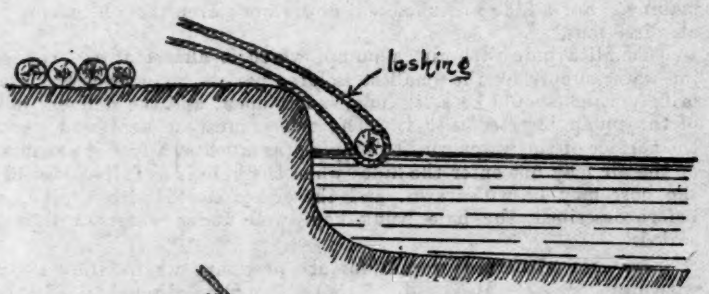


Fig 8.

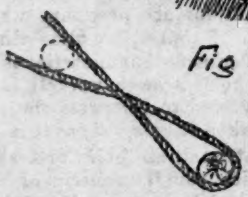
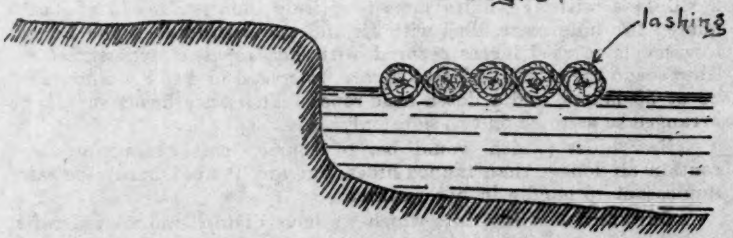


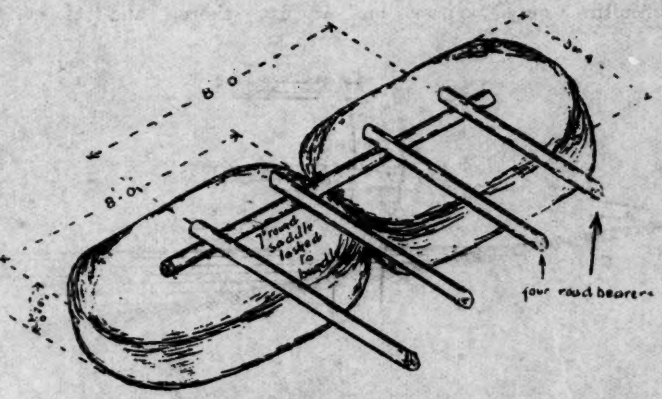
Fig. 9.



the water, and held there, while two stout and long lashings are passed round it at either end, so that the bights are round the ends of the log, and the four ends of the two lashings are held on shore, as in Figure 7. The ends of each lashing are then crossed, as in Figure 8, and the next log is rolled in. Continue crossing and rolling in logs; the lashings will be wound in and out, over and under the logs, as in Figure 9, and the raft will be temporarily secure. It can be further strengthened as required.

We will now turn to rafts of stuffed covers. Stuffed skins have been dealt with in the previous heading of rafts, and will not, therefore, be explained here, which, however, is perhaps their proper place. The following is an account of a light bridge made out of wagon covers stuffed with heather (Figure 10). The principle could

Fig 10.



easily be applied to the making of rafts. Each pier of the bridge consisted of two stuffed bundles, about 8 feet apart, centre to centre. Each bundle consisted of a wagon cover stuffed with heather. A bundle was made up by laying a cover on the ground, piling on it as much heather as it would hold, and fastening it up securely with its own lashings, so that the joint came on top. The ends of the cover fold over and meet on the top, so that the only hole is a narrow slit on the upper surface where water does not reach. If sufficient covers were available it would be advisable to place a second cover round the first, breaking joint with it. Four such bundles, with the usual superstructure, would make an admirable raft. One pier of two bundles supported 3,040 lbs. Forage cart covers were tried, but they are too small and too much split up to be satisfactory. The big bundles give great flotation and steadiness, and stand immersion for days without sinking. *They should not be overloaded.* We also used, with success, waterproof corn sacks stuffed, with a bamboo superstructure. Ordinary corn sacks leak too much to be of any use. Something might be made of waterproof kit bags, if some enterprising individual would take the matter up. It has been tried before, and the experiment abandoned, but that was in conservative days. Very possibly wagon covers might be designed with reference to their possible use in rafting, and a good repairing outfit carried. It is worth while remembering that, since the swimmers of a unit can tow the rafts across and swim the horses, the non-swimmers should be specially trained as raft makers.

Before leaving the subject of rafts, there are a few points worth mentioning about the rafting of guns and vehicles. Whether the raft be an improvised one, such as those we have been discussing, or whether it belongs to the regular equipment of a unit, difficulties are sure to arise in running vehicles on and off, especially in tidal streams.

The chief difficulty is to keep the inshore boat afloat during the operation of running on. The weight of the vehicle lowers the boat in the water, and it will ground if great care is not taken. Moreover, if a tide is running out, the boat will be aground after the vehicle is on board, unless the men are quick in shoving off. These difficulties only appear on a flat shore, and it is on

Fig 11

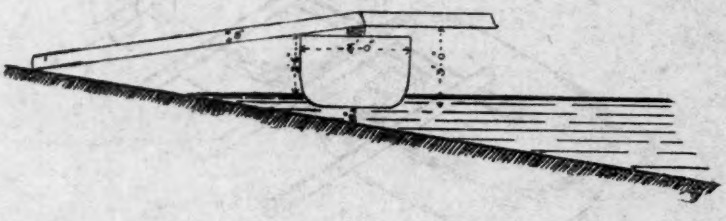
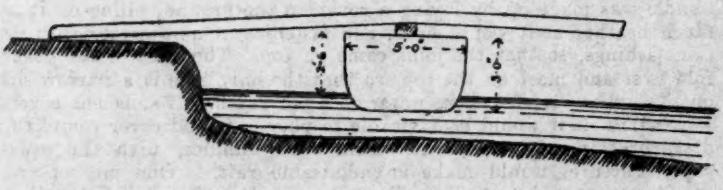


Fig 12.



such a shore that the slope of the shore-skids,[1] and therefore the difficulty of running on the vehicle is greatest. Figures 11 and 12 make this clear. On a very flat shore you need either very long, and therefore very heavy shore-skids, which are not easy to handle, or a movable ramp on the embarking shore. Such a ramp would support the shore ends of the shore-skids about 2 feet off the ground, as in Figures 13 and 13a. The length of the ramp will vary with the slope of the shore, but may average 9 feet. It should be wide enough to receive with ease the shore skids at the maximum distance apart required. For normal wheel tracks, viz. 5 feet 2 inches, the ramp should be at least 6 feet 6 inches between

[1] Channel-shaped beams along which the wheels run on the raft.

its ribands, or, if unribanded, 7 feet between the outer edges of its chesses. The shore-skids should rest on shelves at a lower level than the chesses, so as to bring the level of the *tread* of the skid the same as that of the ramp platform. The ramp should be fitted wth handles at each side, as it has often to be shifted.

If such a raft equipment is improvised, there are a few points to remember. Make your wheel-guides high above the tread of the skids, or above the level of the raft platform. Allow room for maximum wheel track and wheelbase, and a comfortable amount over, say 6 inches to 10 inches for the former, and 18 inches for the latter.

Fig. 13.

Front Elevation

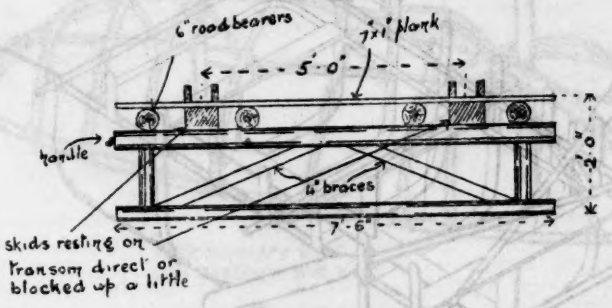
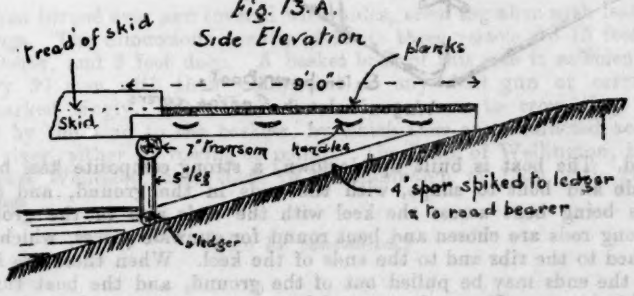


Fig. 13.A.

Side Elevation

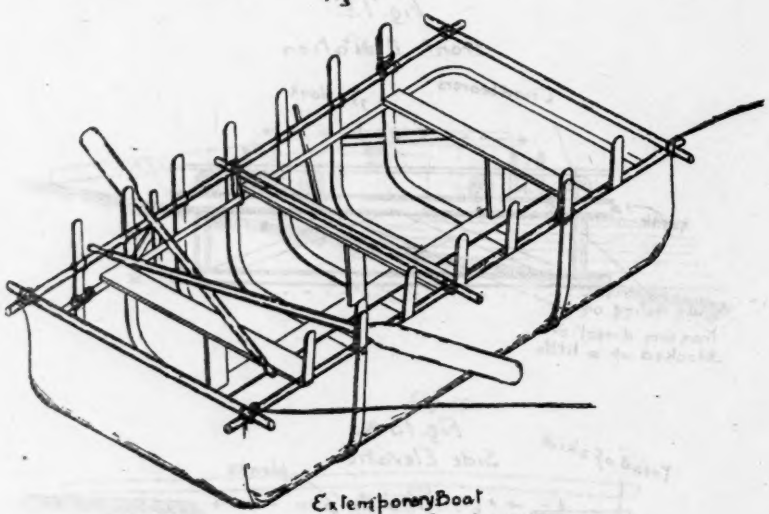


Prepare small scotches for each side of every wheel on the raft. Take care that your shore-skids are long enough or your gunwales low enough to prevent the former resting on the latter on a flat shore, which they have a great tendency to do (as in Figure 11).

We now come to the third method of crossing rivers, viz., by means of boats. The two improvised boats, of which a description follows, have always appeared serviceable. The first (Figure 14) was built up of the balehoops and covers of a general service wagon. The bales form the ribs, which are prevented from spreading by being

tied together at the top. At bow and stern an extra balehoop (or suitable bent stick) may be placed to make the ends, and longitudinal rods should connect the ribs as keel and gunwale pieces; to these the ribs are tightly lashed. In Figure 14 two bale hoops are shown on the outside of the cover to secure the latter. Planks may be placed along the bottom as bottom boards, and across the boats (fixed to longitudinals below the gunwales) as seats. A few sandbags are required as ballast. This boat has immense buoyancy, and can be rowed, though it is of course very slow. The second boat (Figure 15) is built up of saplings, preferably of ash, though willow has been

Fig 14



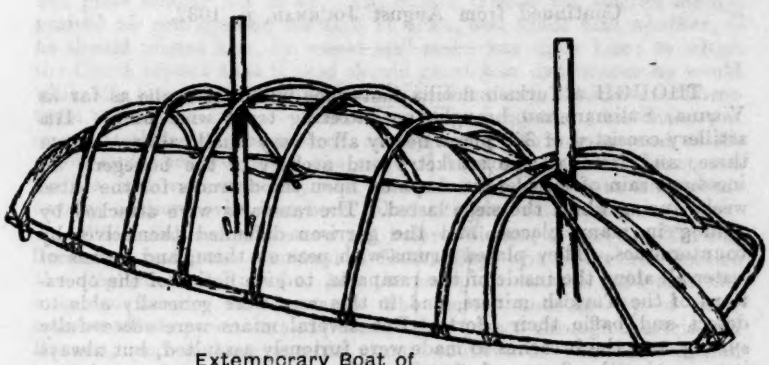
Extemporery Boat
Wagon bales & Canvas covers

used. The boat is built upside-down, a strong composite keel being made and bent to shape, with the ends in the ground, and cross ribs being bent across the keel with the ends also in the ground. Strong rods are chosen and bent round for gunwale pieces, which are lashed to the ribs and to the ends of the keel. When these are fixed all the ends may be pulled out of the ground, and the boat turned right side up. It may be covered by a wagon cover or piece of sound canvas, tied to the gunwales. A couple of crowbars lashed to the keel help to steady the boat. Seats may be provided as before, and the oars lashed loosely to the gunwales or ends of the ribs. Though slow, this boat is not at all unmanageable.

Sir Howard Douglas gives the following account of the basket boats used by the natives of India to cross their wide and rapid rivers. He says—"The framework or basket is constructed of split bamboos, and the covering formed of half-dressed hides. A number of pieces of split bamboos are laid on the ground, crossing each other near their centres, and fastened together with leather thongs. The

ends of the bamboos are then raised to a sufficient height, fixed by stakes at due distances from each other, and then bound together by slips of bamboo, introduced alternately over and under ribs, as they may be called, beginning from the bottom and working upwards, till the skeleton is completed. The ends of ribs above the intended height or depth are then cut off, and the stakes removed; the frame

Fig 15.



Extemporary Boat of ash saplings and wire.

is then turned over and covered with hides, sewn together with leather thongs. The dimensions usually given to these vessels are 15 feet in diameter, and 3 feet deep. A basket boat of this size is sufficient to carry 30 men with their equipment or any field gun or carriage embarked singly. When bullocks or horses are to cross they are tied by the head to the baskets, by which they are conducted across the river, either by rowing or poling. The Duke of Wellington, then Colonel Wellesley, used them in the campaign of 1800 with great success."

(To be continued.)

WARS OF THE TURKS WITH THE GERMANS.

By Lieut.-General F. H. TYRRELL, late Indian Army.

Continued from August JOURNAL, p. 1032.

THOUGH a Turkish flotilla had come up the Danube as far as Vienna, Suliman had brought no battering train with him. His artillery consisted of 300 pieces nearly all of very small calibre. From these, and from all the musketry and archery of the besiegers, an incessant rain of missiles was kept up upon the defences for the three weeks during which the siege lasted. The ramparts were attacked by mining in many places; and the garrison defended themselves by countermines. They placed drums with peas on them, and vessels of water all along the inside of the ramparts, to give notice of the operations of the Turkish miners, and in this way were generally able to detect and baffle their efforts. But several mines were successfully sprung, and the breaches so made were furiously assaulted, but always in vain, by the flower of the Osmanli troops. On one occasion a Turkish Bairakdár planted his standard on the rampart, but he immediately received a musket-shot and fell into the ditch. At length the Janissaries refused to face further the huge two-handed swords, the ponderous halberts, pole-axes, and morning-stars wielded by the German soldiers. The Sultan in vain encouraged them to fresh efforts, and he even paid them the assault-money, which was their due only after a successful assault. But it was impossible to overcome the courage and constancy of the defenders. The brave old Count Salm was mortally wounded in the last unsuccessful general assault, and the monument erected to him by the gratitude of his Emperor may still be seen at the family residence of the Salms at Raitz in Moravia

The season was now far advanced (there was a heavy snowstorm on the 17th October), and supplies ran short in the Turkish camp. The Sultan reluctantly gave the order to raise the siege; the Turks set fire to their huts and forage, and massacred all their Christian prisoners according to their usual custom. The Grand Army retreated upon Buda-Pesth, its soldiers "wreaking vengeance for the failure of their main purpose on every object, animate and inanimate, within their reach." The German garrisons sallied out and hung upon their flanks, cutting off stragglers, and re-capturing many captive Christian boys and girls. All Turkish prisoners were racked or otherwise tortured before being drowned or burnt alive; the Christians seemed bent on vying with the Mussulmans in cruelty.

Sultan Suliman himself, however, generally behaved with clemency and magnanimity to his foes; he praised the valour of the Germans saying he was glad to find such bravery in men who would soon be his subjects.

A cornet of Cuirassiers, named von Zedlitz, had been made prisoner by the Turks in a skirmish; his captors would have killed him, "but being armed with a whole cuirass, no one could strip him, else without doubt in their fury they would have sabred and cut him to pieces." They carried him before Suliman, and made many vain attempts to unfasten his armour, but when the Sultan had promised him his life, "he showed the interpreter two little screws at the side, which being loosed, the cuirass came to its pieces, to the great wonder of the Turks," who could not conceive how a man could fight under such a load of iron. They themselves used chain armour but little, and plate armour not at all. The Sultan treated von Zedlitz kindly, praised his courage and his skill at arms, and asked him whether, if he should release him, he would still make war upon him; to which the Count replied that if God should grant him deliverance he would while life lasted fight against the Turks more hotly than ever. Thereupon the Sultan said:—"Thou shalt be free, my man, and make war on me as thou wilt for the rest of thy life." He was as good as his word, and when he raised the siege of Vienna he loaded Count von Zedlitz with rich presents, and released him, along with one of his cavalry soldiers, who had been taken prisoner with him.

While Suliman was encamped before Vienna, a party of Turkish horsemen, under the command of Kasim Bey, who afterwards became the Beglerbeg of Rumelia, left the camp to make a raid into the unknown interior of Germany. The secrecy and celerity of their march baffled opposition and pursuit; they passed through Austria and Bavaria, and making a wide circuit southwards entered Venetian territory, and finally re-entered the Turkish dominions at Essek on the Drave, with sadly diminished numbers and with men and horses exhausted by continuous marching and fighting. Avliya Effendi says he saw many of the graves of these Gházis at the spot where they had fallen, during the course of his travels in Germany.

The Sultan made a triumphal entry into Constantinople at the head of the troops whose quarters lay there, or in Asia, the rest of the army having rejoined their territorial stations *en route*. He had expelled the Germans from Hungary, but he had failed to subdue them, and he had suffered heavy losses in men and *matériel*, but above all in prestige, for the successful resistance of Vienna had broken the spell of Turkish victory. Their repulse from before its walls marked the turning point of the tide of Ottoman conquest; the Turkish warriors had no longer Sclaves and Magyars to contend with, but men of the Teutonic race, whose steadfast courage remained unshaken by the number or the fury of their foes.

The Sultan publicly announced that his only object in besieging Vienna was to capture the Archduke Ferdinand, who had the insolence to dispute the kingdom of Hungary with him; and that, therefore, when he found that Ferdinand was not in the city, he had not thought it worth while to prosecute the siege; the Turkish historians also have adopted this very obvious subterfuge to explain away the ill-success of their arms. The Sultan, however, set to work with great energy to make preparations for a renewal of his project of the conquest of Germany. For the space of two years he collected stores, munitions, and men from every corner of his vast empire, and in the spring of 1532 he took the field at the head of an army reckoned at 300,000 men.

But the news of these great preparations had resounded through Christendom, and this time the Germans were fully prepared to meet the threatened attack. The Emperor Charles the Fifth had collected all the available forces from all the lands under his sway, and the troops of Spain, Italy, and the Low Countries were united with the armies of the Electors and Landgraves of Germany.

A mighty host of 30,000 horse and 100,000 foot, of whom 20,000 were Arquebusiers, with a large train of artillery, was mustered at Linz, whence the Emperor led them to take up a position to cover Vienna. The order of battle for receiving the attack of the Turks was carefully rehearsed. The whole of the infantry *a l'armé blanche*, the German lanzknechts with their long pikes, the Spanish infantry with sword and buckler, the bands of Swiss halberdiers, were drawn up in three battalia, or huge hollow squares. The Arquebusiers, in three divisions, were formed in line in front of the battalia, in five ranks. The front rank was to deliver its fire, turn outwards, and file round the flanks to reform and reload in rear of the fifth rank; each rank was to do the same in succession; when pressed by the enemy they were to seek shelter inside the battalia. The guns were planted in the intervals of the line. The cavalry were formed in two divisions, in the intervals between the battalia; the Emperor in person commanded the right division, his brother, the Archduke Ferdinand, the left. The Hungarian light horse was stationed on the flanks to cover them, and to delay and confuse the Turks by skirmishing with them, and to act independently as occasion offered. "For in light skirmishes," says Knolles in his Turkish history, "the German horsemen are oftentimes put to the worst, who, mounted upon heavy horses fitter for a set battle, can neither so readily charge the enemy, nor pursue him in his flight, as can the Turkes with their nimble, ready, light horsemen, so well acquainted with that manner of flying fight that they would, with wheeling about, easily frustrate the first charge of the heavy horsemen, and by-and-bye come upon them again with a fresh charge, and so often retire and come on again, until they had either wearied or overthrown them. But the Hungarians, acquainted with that manner of fight as well as they, and also better armed,[1] did easily encounter the Turkes and foil them, although they were in number more."

The eyes of the whole civilised world were fixed upon the plains before the city of Vienna, where the contest between Christendom and Islam was to be decided in a second battle of Tours, waged between the two greatest monarchs of the age at the head of the mightiest hosts that could be furnished by the nations of the West and the East.

But Suliman disappointed expectations by shunning the contest. Instead of marching on Vienna he moved through southern Hungary into Styria. Here the castle of Güns, strong both by nature and art, and heroically defended by its small garrison, delayed the Turkish Grand Army before its walls for twenty-five days.

The Sultan's rapid advance had left his battering train behind, and a continual series of assaults were repulsed by the courage and constancy of the defenders. To save his face, Suliman induced the indomitable Castellan Jurachich to visit his camp under a safe conduct

[1] The allusion is to defensive armour.

guaranteed by the exchange of hostages; he loaded him with gifts, praised his courage, and pretended to have concluded terms with him; after which, unwilling to waste any more time before such an insignificant fortress, he marched on Gratz and took and plundered the town, but the garrison had retired into the citadel and he could not reduce it. Meanwhile, 30,000 Sackmen had entered Austria apparently under the impression that the Grand Army was following them; and they proceeded to repeat their devastation of the previous campaign. As soon as the Emperor learned that the Sultan's army had diverged into Styria, he sent off all the cavalry from Vienna to fall upon the Sackmen; and numbers of those marauders scattered over the country in quest of plunder, were cut off and slain. The rest assembled and tried to rejoin the main army in Styria; but the passes and defiles of the mountains were stopped by abattis, defended by the armed peasantry with the aid of some companies of Arquebusiers, and the Turkish horsemen were unable to get through. They then tried to cut their way through the German cavalry; but were everywhere headed off and driven back. In the neighbourhood of Siebenstein hundreds of them were surrounded and forced over a precipice, which to this day bears the name of "The Turk's Fall." Their leader, the hereditary Akinji Báshi, or Chief of the Sackmen, was slain, and his jewelled helmet adorned with vulture's wings is still to be seen in the Ambros Museum at Vienna. His lieutenant shared his fate, and the Germans, who gave no quarter, reckoned that they had accounted for 18,000 Sackmen. The remainder escaped by scattering and making their way in small parties by circuitous routes back into Hungary, where they rejoined the Grand Army, which was now retreating from Styria with much plunder and many captives, but with little glory. The Emperor Charles V. was satisfied with the retirement of the Turks, and did not attempt to follow them; he was more concerned with the progress of the Reformation in Germany, for the Protestant Princes of the Empire had taken advantage of the Turkish peril to extort concessions from him which he was now desirous of recalling.

Suliman was anxious to turn his arms against Persia, which promised an easier conquest; and he concluded a truce for two years with Ferdinand, the latter consenting to pay tribute for the part of the kingdom of Hungary, in the possession of the Germans. But even during the truce Turkish raids upon the Christian frontier lands did not cease; and after its expiration they were carried on so frequently and systematically that they became well nigh intolerable. The Turks had a strong garrison and a fortified *tête-du-pont* at Essek on the Drave, from whence their roving bands issued to plunder all southern Hungary and enslave its inhabitants. Ferdinand, therefore, in the spring of the year 1537, collected an army of 20,000 men for an expedition against Essek, and placed it under the command of John Kazzianer, who had been one of the captains who defended Vienna, and who enjoyed a high reputation. The Horse were Germans, Bohemians, and Hungarians; the Foot were Germans, except some companies of Italian Arquebusiers, commanded by an able officer named Lodrone. There was also a train of artillery. From the first the troops suffered severely from the want of supplies in the country through which they passed, which had been thoroughly devastated by the Turks.

They arrived before Essek, and laid siege to the *tête-du-pont*, but Muhammad Pasha of Belgrade arrived to succour it, and con-

tinually harassed the Christians with his Light Horse and cut off their communications. The soldiers were starving, and Kazzianer called a council of war, which decided that immediate retreat was necessary to save the army. Accordingly a retreat was commenced, but the Turks followed and pressed the retreating troops closely; they outmarched them and laid ambushes for them along the road, galling the retreating column by a constant fire of musketry and of arrows, and delaying its march by forcing its troops to form to meet their threatened attacks. On one occasion the Hungarian Horse charging captured the Turkish field pieces, but the Janissaries charging the Horse recovered the guns. Even in those days of matchlocks and wooden ramrods infantry sometimes proved a match for cavalry.[1] The path of retreat was strewn with abandoned guns and baggage wagons, and it became increasingly difficult to transport the numerous wounded.

At length the harassed and dispirited troops arrived within a day's march of the castle of Walpo, which was held for King Ferdinand, and here they hoped to find provisions and shelter from their implacable pursuers. But a thick forest lay between them and safety, and to escape the attacks of the Turks upon their line of march, Kazzianer determined to move off by night, and as secretly as possible, abandoning all the guns and carriages, and mounting the sick and wounded *en croupe* behind the cavalry soldiers. A single trumpet note from his tent was to give the signal for the start. But directly darkness fell the soldiers began to steal away, so as to be the first in flight, and Kazzianer suddenly discovered that the whole army was dispersing, and in his hurry he set out himself without sounding the trumpet. Lodrone's Arquebusiers and some other troops, who were under better discipline than the rest, remained in their bivouacs awaiting the sound of the trumpet till they were surprised by the dawn, and found themselves deserted by their General and by their comrades.

Lodrone encouraged them, and told them their only chance of escape was by keeping their ranks and showing a bold front to the enemy; and he hamstrung his horse with his own hand, to show the soldiers that he would stand by them and share their fate. They were immediately followed and continually harassed by the Turkish cavalry, while the Janissaries and archers galled them by an incessant dropping fire of musketry and arrows, which their haste to escape prevented them from returning. The Turkish infantry outmarching them, laid an ambush in some thickets near the road, and from thence poured such a heavy fire into the column that the ranks were broken, and Lodrone was dangerously wounded; all order was lost, and the Turkish cavalry, seizing the opportunity, broke in upon them and put them all to the sword. A few were made prisoners, amongst whom was Lodrone; but as it was doubtful whether he would recover from his wounds, the Turks made sure of him by striking off his head, which they sent to the Sultan along with other trophies of the victory.

This was the most signal success hitherto gained by the Turks over the Germans; for the Christian army was dispersed, and the best part of it destroyed, and all its guns and baggage taken by a Turkish force inferior in numbers; the success was chiefly due to

[1] This exploit of infantry charging cavalry, so rare in military annals, was performed by the Fifth Fusiliers at El Bodon in the Peninsular War.

the skill with which the operations were conducted by Muhammad Pasha of Belgrade.

Kazzianer was brought to trial for causing the loss of his army by his misconduct, but fearing the result he escaped and sought refuge with the Turks.

Ferdinand was much depressed by this disaster, and sought an accommodation with Zapolya, who was equally weary of the war, for his unfortunate Hungarians were between the devil and the deep sea, suffering as much, or more, from their Turkish friends than from their German enemies. The two rival Kings of Hungary, therefore, concluded a treaty by which Ferdinand withdrew his claim, and ceded his rights to Zapolya; but a secret article was inserted in the treaty, by which Zapolya bequeathed his kingdom to Ferdinand at his death. Zapolya died in 1540, leaving an infant son by a Polish Princess; the widow ignored the secret article, and proclaimed her son King of Hungary, and most of the Hungarian magnates supported her. Ferdinand assembled an army for the invasion of Hungary, and entrusted the command of it to Count Roggendorff; the Queen-mother appealed for aid to the Sultan, and he commanded the Pashas of Belgrade and of Bosnia to proceed at once to her assistance, and ordered the assembly of the Grand Army in the spring for the same purpose.

The two Pashas set out with all the forces they could muster, conveying their guns and stores up the Danube in a flotilla. But an early winter set in with extraordinary severity; the river was frozen over, and the boats were frozen in, and the Turkish troops were obliged to encamp on the banks throughout the whole of a very rigorous winter, during which they bore their sufferings from cold and privation with exemplary fortitude. Meanwhile, the German Army had taken Pesth and laid siege to Buda; but the arrival of winter compelled them to go into winter quarters.

In the spring they resumed the siege of Buda; but they had not made much progress with it before the two Pashas arrived with their army and flotilla. They were not strong enough to attack the Germans but they set themselves to harass them by a war of posts and skirmishes and constant alarms, so that the Germans were as much besieged as besieging.

Experienced officers advised Count Roggendorff to raise the siege and withdraw the troops across the river to Pesth; but he persisted in continuing the siege, until he received intelligence that the Sultan was fast approaching at the head of a great army; he then bethought himself of taking the advice and re-crossing the bridge of boats which connected his camp with Pesth. He selected a dark night for the retreat in order to escape the unwelcome attentions of the Turks, but Muhammad Pasha was kept perfectly informed by means of Hungarian spies of all that went on in the German camp. Accordingly no sooner had the retreat begun than the Turks commenced a vigorous night attack on the camp, on the bridge, and on Pesth at the same time. They set fire to some stacks of forage by the river side, and the blaze made the whole scene as bright as day, and enabled the Turkish gunners to direct their aim upon the bridge, which was soon broken up, and the Turkish flotilla coming up, the stream became choked with craft. The Germans in Pesth, who were looking out to assist the passage of their comrades, saw to their consternation the white caps of

the Janissaries in the boats approaching the shore, and, struck with panic, abandoned their defences, and the Turks, landing, took possession of them. The Germans on the other shore seeing their retreat cut off, seized on what boats they could to escape up the river to Gran, and some of them succeeded in doing so, carrying with them their General, Roggendorff, who had been disabled by a wound in the beginning of the fighting. The rout was complete; some thousands of the Germans were slain or drowned in the river, and one thousand were made prisoners. Their camp, with all their stores and baggage and two hundred pieces of artillery, were taken by the Turks.

Shortly after Sultan Suliman arrived, and found the work of relieving Buda already accomplished. He lavished praise and rewards upon the victors, and appointed Muhammad Pasha of Belgrade to be Beglerbeg of Rumelia. He ordered a grand parade of his whole army, when the captives taken in the late battle were brought out, bound with ropes, that the Ajam Oghlans (recruits for the Janissaries) might flesh their maiden swords on them, in accordance with the Turkish practice of blooding these young dogs of war. And the German prisoners were all by them murdered in cold blood; "butchered to make a Turkish holiday." Knolles relates the following anecdote of what took place upon this occasion:—

"Among the prisoners was one soldier of Bavaria of an exceeding high stature. Him the Sultan, in despite of the German nation, delivered to a little dwarf (whom his sons made great account of) to be slaine, whose head was scarce so high as the knees of the tall captive, with that cruell spite to aggravate the indignity of his death. Whereas that goodly tall man, mangled about the legs a long time by that apish dwarf with his little scimitar, as if it had been in disport, fell down, and was with many feeble blowes hardly at laste slaine by that wretch, still heartened on by others to satisfy the eyes of the Princes beholding it for their sport."

Suliman now put into execution a plan that he had long meditated. The Turkish soldiers were permitted to come and go freely between their camp and the city of Buda; and one day when there was an unusual number of them in the town, on a preconcerted signal they formed in their ranks and occupied the gates and avenues of the city, disarming the Hungarians at the guard-houses and occupying their places. The Christians, taken by surprise and overawed by numbers, could make no resistance, and large bodies of Turkish troops at once marching in through the gates, Buda fell into the Sultan's hands without a blow being struck; hardly was even a word spoken.

The Sultan at once issued a proclamation annexing the whole of Hungary to the Ottoman Empire. The infant son of Zapolya was compensated for the loss of his kingdom by his nomination to be tributary Prince of Transylvania, and he and his mother were despatched to take possession of his patrimony under the protection of a Turkish army. A Pasha was appointed as Governor of Buda and Beglerbeg of Hungary. The lands of the newly annexed country were parcelled out in military fiefs for the support of the Turkish Toprakli (Territorial) Cavalry, as in the other provinces of the Empire. Garrisons of Janissaries were placed in all the fortresses.

Suliman spent the remainder of the summer in regulating the affairs of Hungary, and at the approach of winter returned to Constantinople. Ferdinand had sent an embassy to him praying that he

might be allowed to enjoy the kingdom of Hungary on the same terms as Zapolya, as a tributary of the Sultan; but the Austrian envoy, happening in the course of an audience to speak of Charles V. by the title of Emperor of Germany, Suliman flew into a violent passion, and threw the envoy into prison. According to the Turkish theory, the Sultan, in virtue of the conquest of Constantinople, was the only legitimate successor of the Roman Emperors, and all the rulers of Europe, "the seven infidel Kings of Farangistan," were vassals in rebellion against his authority. The maintenance of Embassies at the Porte was looked upon as a confession of inferiority; for in Asia it was only tributary or protected States that kept a permanent agent at the Court of their Suzerain. The representatives of the great European Powers were treated by the Porte with an insolence which it is difficult to realise in these days; and up to the beginning of the nineteenth century their Ambassadors at Constantinople were thrown into prison on any difference arising between their Courts and the Porte. Ferdinand, however, was resolved to make good his claim. In the spring of the next year he despatched a fresh army, which he had collected during the winter, under the command of the Marquis of Brandenburg, to expel the Turks from Hungary. The famous Maurice of Saxony served as a volunteer on this expedition. The Germans laid siege to Pesth, and by battery made "a saultable breach" in the walls; but the Turks, with great diligence, cut away the rampart inside, so that when the German forlorn hope topped the breach, its soldiers found themselves confronted by a yawning chasm, into which they feared to leap down, while the Turks fired on them from behind traverses and from the ramparts on each side of the breach. The assault failed, and before it could be renewed news arrived that the Sultan was approaching with his army. The Germans raised the siege and retreated with precipitation, the besieged Turks assuming the offensive and following closely at their heels. The disaster which overtook Kazzianer and Roggendorff was only averted by the courage and steadiness of three companies of Italian arquebusiers, which had been lent to Ferdinand by the Pope. Some of the Turks who knew Italian rode up to them, calling out to them to come over to them, when they would be well rewarded and honourably treated, and adjuring them not to sacrifice their gallant lives for the sake of the lazy and cowardly Germans; but their blandishments had no better success than their arms, and all their attacks were successfully beaten off by the Italians, till the retreating army found a refuge under the walls of Gran.

Suliman now determined to reduce the fortresses of Gran and Stuhlweissenburg to prevent the renewal of the German attempts on Buda-Pesth. He first marched on Gran and opened trenches and manned batteries against its walls. One of the Turkish gunners knocked off the bronze cross on the top of the Cathedral, and this was accepted as an omen of the approaching fall of the place by both besiegers and besieged. The garrison offered to capitulate, and were permitted to depart with their lives and personal baggage after laying down their arms. As they filed out of the citadel gates between the ranks of the Janissaries, they grounded their arms and accoutrements, and a soldier carelessly throwing down his bandolier with the match lighted, some powder that had been spilled from a powder flask ignited and caused an explosion, whereby some of the Janissaries were hurt. They attacked the Germans with drawn swords; but their officers, seeing that it was an accident, pacified them before much harm had

been done, and the capitulation was carried out without further trouble.

Suliman next marched on Stuhlweissenburg, or Alba Regalis, the royal city of Hungary. It was situated in a marshy plain, and the roads leading to it were carried through the marshes over long causeways, the heads of which were protected by fortified works and strong garrisons. The Turks commenced operations against one of these posts. They cut and made an enormous number of fascines in the neighbouring woods, with which they filled up the marshes around the work, so that they could reach the causeway in its rear, and assault it on all sides at once. Its defenders, seeing this, evacuated the work and fled towards the city, hotly pursued by the Turks. The guards at the city gate, fearing lest the Turks should enter at the heels of the fugitives, shut the gates, leaving only the wicket open. The foremost of the crowd of flying men got jammed in the wicket, and blocked the way of the remainder, who were overtaken by the Turks and put to the sword. Many of them leapt from the causeway into the marsh, where they served as targets for the Turkish archers and arquebusiers. This slaughter of their comrades so intimidated the garrison that they sent a trumpet to the Sultan to propose terms of surrender, and it was arranged that the garrison should march out with their arms and the honours of war, and depart free and uninjured. But a company of German reiters in the garrison had wheel-lock pistols, which greatly excited the curiosity of the Turks, who had never seen such weapons before, and they despoiled the horsemen of their pistols; otherwise the terms of the capitulation were faithfully observed.

Suliman placed strong garrisons in the two captured cities, making them the frontier fortresses of his Empire on the west, and trusting to them to bar any future invasion of Turkish Hungary by a German army. The Turks called Gran by the name of Usturghún, from its Latin name of Strigonium, and Stuhlweissenburg they called Istuli or Istulini. While Suliman was engaged in these sieges a Turkish force from Essek captured Fünfkirchen, and occupied all Southern Hungary. Suliman returned to Constantinople, and did not re-visit Hungary for more than twenty years.

The war was conducted by the Pashas of Buda, and a continual series of raids and forays went on along the ill-defined frontiers. In the articles of truce concluded from time to time it was always stipulated that the inhabitants who had paid taxes to one Government should not be called on to pay them over again to the other. The Sultan was occupied with wars in the Mediterranean against the Spaniards and Venetians, and in the Indian Ocean against the Portuguese; and Ferdinand, who had now become Emperor after the abdication of his brother Charles, was too busy at home to make further attempts upon Turkish Hungary. In 1552 Muhammad Pasha captured Temesvar, but during the long war the Turks gained little ground, and the German garrisons in Comorn and Raab still faced the brigades of Janissaries quartered at Gran and Stuhlweissenburg. In 1564 Ferdinand died, and his son Maximilian, who succeeded him in the Archduchy of Austria, was elected Emperor of Germany in his stead, and he prosecuted the war against the Turks with such vigour that it recalled the aged Sultan again into the field.

In 1565 a German army invaded Transylvania, and Suliman despatched an army of Crim Tartars to aid the Prince of Transylvania against the invaders. Tartars had not been seen in Hungary since

the days of the great invasion of Batu Khan and his Mongols three centuries before, and they were no more welcome now than they were then. The Prince found them ruinous allies, and drove them from his county by force of arms, while the Germans reduced his towns and castles. Next year (1566) Sultan Suliman, now seventy-five years old, took the field with his grand army, and entered Hungary for the sixth time.

The Germans retired before him, and he marched northwards, and laid siege to Erlau. Count Nicholas Zriny, a Hungarian nobleman, with a small force, was deputed by Maximilian to watch the movements of the Turks, and he, learning that the Pasha of Bosnia was bringing up a convoy of supplies for the Sultan's army, surprised and routed him and captured the convoy. Suliman was so enraged at this insult that he raised the siege of Erlau and marched in pursuit of Zriny, who, with 3,500 men, threw himself into the small fortified town of Sigeth. Here Count Zriny, who has been called the Leonidas of Hungary, held out against repeated assaults of the besieging hosts for seventeen days, till his garrison was reduced to 600 men, and his last refuge in the upper castle was reduced to ruins. He then laid a train with a slow match to his powder magazine and sallied out at the head of his six hundred to sell their lives as dearly as possible. He soon fell covered with wounds, and all his followers shared his fate except a few who were saved by the Janissaries putting their own caps upon their heads—an instance of chivalry unfortunately rare in Turkish military annals. Many Turks who had entered the castle in search of booty perished in the explosion of the magazine, and it has been stated by Christian writers that 35,000 Turks perished at the siege of Sigeth. But writers in those days had little idea of the value of accuracy in matters historical or arithmetical.

The old Sultan died in his bed during the progress of the siege, worn out by a long life of ceaseless exertion. His death was concealed from the troops by the Oriental expedient of putting to death the physician who had attended him, until the conclusion of the siege. So the Turks say that Sultan Suliman conquered the towns of Sigeth, Gyula, and Komar after his death.

The war was continued in a desultory fashion for two years more without advantage to either side, and in 1568 Sultan Selim II., nicknamed the Drunken, the son and successor of Suliman, being anxious to wrest the Island of Cyprus from the Venetians for the sake of its excellent wine, concluded a truce for eight years with the Emperor Maximilian on the basis of *uti possidetis*. The latter agreed to pay tribute for his half of Hungary, and moreover to pay up all arrears of tribute left unpaid by his father. The truce lasted for a quarter of a century, being renewed in 1575 and again in 1583. Yet a petty war of raids and forays, surprises and skirmishes went on continually along the ill-defined frontiers between German and Turkish Hungary, just as in the case of the borders between England and Scotland. Turkish Aghas and German captains sometimes took part in these excursions and alarms, but as long as no great force and no artillery were employed, the respective Governments did not think it worth while to interfere. The advantage in this petty warfare was mostly on the side of the Turks, to whom war was both the pleasure and the business of their lives.

The peace left the kingdom of Hungary pretty equally divided between the Emperor and the Sultan, the latter having the largest

share. The central, eastern, and southern regions of the country belonged to the Turks; the western and northern districts to the Germans. Turkish Hungary, or Majáristán (Magyar-land), was divided, like ancient Gaul, into three parts, the chief towns of which were: Buda in the centre, Temesvar in the east, and Fünfkirchen, or Kanisa, in the south. Buda had eight sanjaks or military districts, Temesvar had seven, Kanisa had only four. The Pasha of Buda was Beglerbeg of all Hungary, chief of its Territorial Militia. He had a standard of three horse-tails, and the title of Vazir, and ranked with the Pashas of Baghdad in Asia, and of Cairo in Africa, as one of the three premier Pashas of the Empire, each of the three taking precedence of the other two in his own continent. He wore an aigrette like the Sultan, but upon the left side of his turban, and he held a divan or council, attended by the chief officials of the province, the doctors of law, and the Sarhad Agha (brigadier-general) of the Janissaries. It was fitting in a warlike nation like the Osmanlis that the land of Majáristán. thrust forward like a wedge into the heart of hostile Europe, should enjoy the highest rank among the provinces of the Empire.

(To be continued.)

THE BATTLE OFF TSU-SHIMA.

IN MEMORY OF "THE SUVÓROFF."

A PERPETUAL TRIBUTE TO FALLEN HEROES.

Translated from the Russian of Commander Vladimir Semenoff, Imperial Russian Navy,

[With the Author's permission],

By Lieut.-Colonel W. E. GOWAN, Retired List, Indian Army.

(Continued from July JOURNAL, p. 876.)

"To the guns; the torpedo-boats are coming! To the guns!" came the cry along the deck.

It was easy to say, "to the guns!" for out of the twelve 75 mm. guns in the lower battery, there was only one that was undamaged, and that was on the starboard side. But as it so happened, we had not to fire from that this time.

The torpedo-boats cautiously approached us from abaft the stern. According to Japanese accounts this was at 4.20 p.m. Now on the stern platform, behind the wardroom, there was yet another undamaged 75 mm. gun. Volunteer Maximoff, who had taken the place of his slain officer in command of this light Q.F. battery, at once opened a brisk fire from this gun on the advancing torpedo-boats. And they, apparently surprised that this strange smashed up mass, having the mere resemblance of a vessel, should still be so snappish, sheered off, awaiting, no doubt, a more favourable opportunity for visiting us again.

This incident has given me an idea that I ought to explain what force there was at our disposal at this time for beating off torpedo-boat attacks, or, more correctly, to describe the degree of helplessness which we had now reached.

In our lower battery there were altogether crews comprising some 50 men, but they were of the most varied types, yet amongst them, however, were two gun captains. Of the guns, however much we might examine them, we could find, thoroughly serviceable, only one. The gun captains suggested that we might "rig up" another, by replacing the damaged parts of one from corresponding parts of the other[1] that had been finally put out of action.

Then there was still left us Maximoff's gun in the stern.

[1] The Author has already spoken of one wholly serviceable gun of the same calibre in this battery.—W.E.G.

After completing my inspection of the lower battery, I ascended to the upper battery (out of the smaller turrets there was not one that would revolve). Here I was confronted with a scene which most strikingly illustrated the terrible effect of the Japanese projectiles. There was no fire here, simply because everything that could ignite had been already burnt. All four of the 75 mm. guns had been knocked off their mountings, but careful search failed to show either on the guns themselves or on their mountings any trace of direct impact of a shell, or of any of its pieces. Not one. It is clear, then, that such destruction had *not* been produced by any direct impact, but by the force of an explosion. But of what? In this particular battery there had not been stored either torpedoes or pyroxilin. The explanation, then, is only to be found in the enemy's projectiles, which gave out an explosive force equal to that of a torpedo.

To my readers, perhaps, these flittings over a crippled battle-ship for the purpose of ascertaining the amount and extent of the damage done to the vessel will perhaps appear strange. Yes, it would have been strange, if you please, had even an abnormal condition of affairs reigned at this time throughout the vessel. But this was sometimes so terrible as to be unlike that which is strange.[1] It was, moreover, a condition of affairs that would make it perfectly clear to any one, that all was over. Neither past nor future existed for us at all. There remained only the present moment, and the force of an invincible desire to carry out any sort of occupation so as not to think.

After descending once more to the lower battery, I was going to look over the stern battery when I met Kursel.

Ensign of the Fleet Verner Von-Kursel, a native of Courland, and a general favourite in the "Suvóroff's" ward-room, was a man who had made voyages in mercantile vessels almost from the time that he was a baby in long clothes. He could converse in every European language, but equally badly in all. When they chaffed him in the ward-room on this subject, he would answer with an air of mock gravity: "Well, on the whole, I think that I speak in German the best!" Throughout his experience he had seen so much, and had mixed with such a variety of his fellow men, that he never lost his equanimity, and no change of circumstances could prevent his meeting any of his acquaintances with a pleasant smile.

So even now, long before I drew near to him, he had given me a nod of recognition, and as I came up he cheerfully inquired: "Well, what do you make of affairs now?"

"Affairs are going into liquidation," I replied.

"Oh, quite so! But here am I without a single wound, and as for you, you seem to have caught it."

"That is over," I said.

"Where are you going?" was his next question.

"To look over the stern battery, and to get some cigarettes out of my cabin. I have smoked all I had with me."

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[1] This passage may be rendered through the substitution of a word in the text only differing from another word as to one compound letter:—

"That which is horrible may not be altogether like that which is terrible." There seems to be a play on words here: *Stránno* (strange) and *strášhno* (terrible).—W.E.G.

"You are going to your cabin, eh?" and here Kursel gave a sly smirk; and then he added: "I have just come from it. However, let us go, and I will show you the way."

He certainly proved himself to be a useful guide, as he knew of a way that was free of wreckage.

As soon as we had come to the officers' quarters, I stood in some perplexity, for where my cabin had been, and also the two adjoining it, there was a huge gap.

Kursel guffawed, and made merry over his joke.

For the moment I was angry, and with an impatient wave of my hand I turned to go away. But by the time I reached the battery Kursel had overtaken me and had pressed upon me some cigars.

In the lower battery all the outbreaks of fire had been by this time put out, and encouraged by this success we decided upon trying our luck in the upper battery.

A couple of men, employed in the hold,[1] obtained from somewhere some quite new but unfitted hoses. One end of these was bound with wire to the fire cock, and the other was lengthened by securing it, in the same manner, to some tubing.

"Bravo, men!" said Bogdanoff, by way of encouragement.

Having thus secured the hoses, and having wrapped them round with wet bags, we at first only thrust them through the hatchway above the place where Divine Service was held, and then, after having quenched all the smouldering furniture in the temporary dressing-station, we pulled the hoses through to the upper battery. The men worked with a will, and soon in that part of the vessel the conflagration was put out. Suddenly, from behind the central 6-inch turret, a flame burst out. We accordingly moved in that direction. It should here be stated that because this was the most sheltered part of the upper deck, the boxes containing the 47 mm. ammunition, which had been taken down from the bridges, had here been stacked. And these, unfortunately, at the very time that we had assembled to put out the fire all round them, had begun to explode. Several men at once fell, either killed or wounded. And great confusion ensued. "It is nothing; it will soon be over!" said Kursel, as he tried to pacify the men.

But the explosions became more frequent. The new hoses were destroyed one after the other. And at the same moment, from somewhere close at hand, there resounded the familiar harsh sounding thud, accompanied by the crash of splitting iron. Again and again it was repeated. These were not caused by 6-inch shells, but, as before, were produced by the explosions of the "Chemodani." Panic now seized upon our men. Not one of them would listen to a word, and all rushed down below.

When, mortified by the failures of the work which, as it seemed, had been so well begun, we descended to the lower battery, something (it must have been a splinter of some kind) struck me in the side, and I staggered.

"Again in for it?" inquired Kursel, as he took the cigar out of his mouth and sympathisingly inclined his head.

Looking at him, the thought came to me: "What if the whole Squadron had been manned by persons of similar bearing!"

[1] They are there to pump up water in case of the outbreak of fire.—*Author.*

VI.

Meanwhile our Squadron, after making the sharp turn that bore it away from the "Suvóroff," headed, with a gradual incline to starboard, so as not to allow the cutting across its course, which the Japanese had undeviatingly striven to effect. As a result, therefore, of these reciprocal efforts, both the contending Squadrons were moving on the arcs of two concentric circles; our vessels on the inner, the Japanese on the outer.

About 4 p.m., fate, it would seem, attempted for the last time to smile upon us.

Amidst the thick smoke, that poured from the damaged funnels, and that arose from the bursting of the shells, with the consequent conflagrations, and which mingled with the fog still hanging over the sea, the Japanese main body somehow or other parted from our Squadron and lost sight of it altogether.

Japanese sources of information, of which I have made use, refer to this episode very briefly and somewhat obscurely. This only is clear from their accounts, that Togo thought that our Squadron had in some way broken through northwards, for he steered in that direction in search of it, whereas Kamimura did not agree with this opinion, and, therefore, with his cruisers continued to proceed S. and S.W. This, at least, may account for the warm panegyrics that appeared in a special section of a book entitled "Exploit of Admiral Kamimura." Would that this "exploit" had not been possible, and that the battle of the 14th (26th) May could have been finished, and that our Squadron could have had time to collect and to change the issue of the day.

Steering first S. and then S.W., Kamimura heard a fierce cannonade, the sound of which came from the west, and he steered directly towards it. It came from the attack (up to that time quite unsuccessful) of Admiral Kataoka's vessels on our cruisers and transports. Kamimura then took an active part in the engagement, and very soon discovered the whereabouts of our main body, which, after describing an almost complete circle, with a diameter of about 5 miles, had returned to the very point whence the "Alexander" had made her sudden and sharp turn, and in the neighbourhood of which the "Suvóroff" was helplessly drifting.

Time about 5 p.m.—Kursel and I, and others, were standing in the lower battery, smoking cigars and exchanging remarks about matters in no way connected with the scene before us, when the "Suvóroff" once more found herself in the centre of our Squadron, which was heading in disorder in a northerly direction.

Some of our vessels passed us to starboard, others to port. The van-leader was the "Borodino" (Captain of the First Rank Serébriannikoff). The "Alexander," badly damaged, and with such a heavy list, that the water was almost up to the ports of her lower battery, was outside the fighting line, and lagging behind it, but she had not ceased to fire from her still serviceable guns. I did not see it, but I am told that the whole of her fore part, from her ram up to her 12-inch turret, had been completely wrecked.

The cruisers and transports, which had closed in towards the main body, were a little behind and to port of the battle-ships, and they were being attacked by vessels belonging to the several divisions

of Admirals Kataoka, Dewa, Oriu, and Togo the younger. Kamimura's vessels were at this time further to starboard, *i.e.*, eastward, and they were on a northerly course.

"Chemodáni," as before, were falling in all directions. Some little time before this we had been informed from the engine-room that the ventilators were circulating not fresh air but smoke, that the men below were being suffocated, and that soon there would be no one left to do the work. And we had also been told that the electric current had become feeble, and that the dynamo was giving out through lack of steam.

"Torpedo-boats are approaching!" was the cry now raised.

We rushed off to our solitary gun (it will be remembered that we had not succeeded in patching up a second one), but the torpedo-boat that was approaching us proved to be the "Buinii." She chanced to be passing by, and, on her own initiative, drew near the battered battle-ship to ask us if she could be of any use.

The Flag-Captain, who was on the sponsoned glacis, ordered Krijanovski to signal by hand to the torpedo-boat "Take the Admiral on board."

I was watching from the battery the movements of the "Buinii," when there suddenly appeared the Admiral's orderly, Peter Putchkoff, who ran towards me, saying:

"Your Honour! Be pleased to go to the turret; the torpedo-boat is alongside, but the Admiral does not wish to be transferred to her!"

It should here be explained that, because the Admiral had not been able to reach the dressing-station, none of us knew how severely wounded he was, since, at the moment of receiving any wound, to all questions put to him he had angrily replied that they were but trifling injuries. And afterwards, when they had carried him into the turret, and had seated him on an ammunition box, he had remained in the same position. And whilst there he had only raised his head to put some question as to the progress of the battle, and had then again relapsed into silence with head depressed. But in the state in which the "Suvóroff" was at this time, what else could he do? His behaviour, therefore, seemed to everyone quite natural, and no one could have thought otherwise than that these questions of his were but mere momentary flashes of energy, or brief scintillations of consciousness. Now, however, on the report being made to him of the approach of the torpedo-boat, he, after rousing himself, had given this clear order: "Summon the Staff Officers!" And having done this he again became overcast, and seemed not to wish to hear anything more.[1]

[1] Out of all the wounded members of the Staff, who were below under the armour-plated deck, they were only able "to summon" Philippovski and Leontieff. The former was in the "military post," which, though completely shut off from the berth deck, had a flow of fresh air through the armour-plated shaft, running down from the conning-tower. But even here he had to sit with candles burning in front of him—the electric lights having been extinguished. The latter was at the opening of the hatchway. The berth deck was in darkness (through the failure of the electric light), and was full of suffocating smoke. The men, who had been sent to seek for members of the Staff, could only call out their names, but, should they receive no answer from them, there was no one

With the aid of Kursel I got out on to the starboard sponsoned glacis in front of the central 6-inch turret, through the folding half-port of the lower battery. I required their assistance, as my right foot was not altogether under control, and I could only tread with the heel of my left foot.

The boatswain and a few sailors were on the glacis, clearing it of burning fragments, which had fallen down from the spar deck. On the starboard bow, at a distance of not more than 3 or 4 cables' lengths,[1] I saw the "Kamchatka" lying motionless.

Kamimura's cruisers were firing at her with the same energy as at us, the only difference being that as regards the "Kamchatka" the task was much easier.

As the "Buini" held on to her course towards our starboard beam, her commander, Captain of the Second Rank Kolomeitseff, called out through the megaphone: "Have you a pinnace in which to bring the Admiral? I have none!" The Flag-Captain and Krijanovski shouted out something in reply.

As I peeped into the turret, the armour-plated door of which was damaged, and would only partially turn on its hinges, I saw that a stout man could scarcely squeeze through it. The Admiral was sitting just like an old man, with head, wrapped in a blood-stained towel, hanging on his chest.

"Your Excellency!" I shouted, "the torpedo-boat has come! It is necessary for you to be conveyed to her."

"Bring Philippovski to me," faintly answered the Admiral, without changing his position.

It was evident from this reply that he had made up his mind to retain the command of the Squadron, after being transferred to another vessel, and for this reason he had called for the Flag Navigating Officer, who was responsible for the observations and for the correct handling of the Flag-ship.

"He will be here at once! They have gone to call him!" I said.

But the Admiral only shook his head and said nothing.

I did not stay to talk any more, as before he could be removed from the turret it was necessary to devise some way of getting him on board the torpedo-boat.

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else to whom they could call, or from whom they could ascertain their whereabouts. In the smoky darkness there reigned a death-like silence. Very likely everyone, who was in the closed compartments, beneath the armour-plated deck, into which the ventilators conveyed "not air but smoke," had gradually been suffocated, lost consciousness, and had died. The vessel's engines were not working; the electric light had failed through insufficiency of steam, wherewith to work the dynamo, and after this no one came out from below. It may be supposed, therefore, that out of the 900 men, who composed the complement of the "Suvóroff," at this time there remained alive only the few who had collected in the lower battery and on the weather sponson.—*Author.*

[1] A little less than half-a-mile.—W.E.G.

(To be continued.)

NAVAL NOTES.

Home. The following are the principal appointments which have been made: Captains—C. E. Madden, M.V.O., to "Dreadnought," and as Chief of Staff to Vice-Admiral Sir F. C. B. Bridgeman, K.C.V.O.; R. H. S. Bacon, C.V.O., D.S.O., to be Director of Naval Ordnance; L. Clinton-Baker to "Berwick"; R. M. Harbord to "Terrible"; V. H. G. Bernard to "Argonaut"; G. C. Maresceaux to "Kent"; P. Vaughan Lewes, D.S.O., to "Cambrian"; F. R. Morgan, M.V.O., to "Britannia"; Sir R. K. Arbuthnot, Bart., to "Lord Nelson"; the Hon. G. A. Hardinge to "Ramillies"; Commander M. H. Hodges to "Sappho."

The following changes in the composition of the Channel and Home Fleets are being carried out:—The first-class armoured cruisers "Black Prince" and "Duke of Edinburgh" are to be attached to the First Cruiser Squadron, bringing the strength of that squadron back to six vessels; the first-class armoured cruiser "Carnarvon" will replace the "Black Prince" in the Second Cruiser Squadron. The 1st and 3rd Destroyer Flotillas, comprising 12 destroyers each, with the 3rd class cruiser "Sapphire," flying the flag of Rear-Admiral Montgomerie, C.V.O., C.B., in command, the "Sapphire II.," the two scouts "Patrol" and "Skirmisher," the depôt-ship "Tyne," and distilling vessel "Aquarius" are transferred from the Home to the Channel Fleet.

The 2nd and 4th destroyer flotillas, under Commodore Bayly, and the three port flotillas, manned with nucleus crews, under their respective captains of destroyers, will remain under the command of the Commander-in-Chief of the Home Fleet, and they will cease to be in any way subject to the authority of Rear-Admiral Montgomerie.

Launches.—On the 27th July the new first-class battle-ship "Bellerophon," and on the 23rd August her sister-ship, the "Temeraire," both of the improved "Dreadnought" type, were launched at Portsmouth and Devonport respectively. Both ships, with the "Superb," which is building at Elswick, have a displacement of 18,600 tons—600 more than the "Dreadnought." Their length is 490 feet and beam 82 feet, while the turbine engines are to develop 23,000-I.H.P., giving a speed of 21 knots. As in the other ships of the class, the main armament will consist of ten 12-inch guns; but it is understood that 4-inch Q.F. guns will be substituted as anti-torpedo guns instead of the 12-pounders carried in the "Dreadnought." It is also stated that there will be a re-arrangement of the 12-inch guns, the effect of which will be to enable eight of these guns to be fired astern as well as on the broadsides. This is to be effected by raising the turret amidships on the quarter-deck, so as to permit the two guns which it carries to be fired over the after turret, which is also the centre line. It is believed that there is some re-arrangement of the armour, and some modification in the cellular construction of the hull, to provide a means for the comparatively harmless exit for the gases set up by an under-water explosion; but all these details affecting the protection of the ships against torpedoes or mines and rearrangement of armour are kept strictly secret.

Home. *The "Lusitania."*—The new Cunarders "Lusitania" and her sister-ship the "Mauretania," being intended to act as auxiliary cruisers in time of war, the following details taken from *The Times* may be of interest. The dimensions of the "Lusitania" are as follows :—

Length over all...	785 feet.
„ between perpendiculars	760 „
Beam, moulded	88 „
Depth, „	60 feet 4½ inches.
Gross tonnage	32,500 tons.
Draught	33 feet 6 inches.
Displacement	38,000 tons.
Type of engine...	Parsons turbine.
Number and type of boilers	Twenty-five cylindrical.
Number of furnaces	192
Steam pressure...	195 lbs.
Total heating surface	158,350 square feet.
„ grate area	4,048 „
Draught	Howden's.
Total I.H.P. (designed)	68,000
Speed (designed)	25 knots.

One important feature dealt with in fixing the designs had reference to the use of the ships as cruisers or scouts in time of war, and the machinery—which is almost entirely under the water-line—has been so disposed in separate compartments, and with coal protection along each side, as to counteract, as far as possible, the effect of the enemy's fire at the water-line. For purposes of attack, the "Lusitania" will be provided with an armament as satisfactory as the armoured cruisers of the County class, because on one of the topmost decks there will be carried, within the shelter of the heavy shell-plating, four 6-inch Q.F. guns attaining a muzzle energy of over 5,000 foot-tons, while on the promenade deck on each side there will be four more guns on central pivot mountings, also able to penetrate 4½-inch armour at 5,000 yards range, and 6-inch armour at 3,000 yards range. With the great speed, which can be maintained for three or four times the period that any modern cruiser can steam even at only 21 knots, and with the careful sub-division for protection and their satisfactory offensive power, the "Lusitania" and her consort may be regarded as most effective additions to any fighting squadron. Their advent is, therefore, a great advantage from the point of view of British sea-power.

The rudder and steering gear are all placed well below the water-line. This is a most important point in respect of protection, should these vessels be ever impressed into the national service. The stern has been suitably shaped in the "Lusitania" to enable this object to be accomplished satisfactorily.

Results of the Official Trials.—With the 25 boilers under normal pressure and with the great turbine spinning round with a peripheral speed of nearly 10,000ft. per minute, the "Lusitania" on her trials in July made a mean speed of 26·45 knots, not as a special spurt, but during two runs over a course 59 miles long, between the Corsewall Light on the Wigtown coast and the Chicken Rock Light on the Isle of Man. This was but one of several most successful tests, to be referred to presently, and under Cunard, Admiralty, and Clydebank official direction, and upon their completion the vessel anchored in the Clyde, at the Tail of the Bank. There the few finishing touches were added to make her ready for service, and

Home.

she will leave Liverpool, as already announced, on her first voyage, on September 7th. Much that is speculative rather than authentic has been said about preliminary and other trials, but, now that all tests have been completed, it is possible to state definitely the main results.

The official speed tests began when the vessel left the Mersey. The speed tests have been of greater length and more exhaustive than any yet carried out, the first being a 48 hours' run at full speed at the draught which corresponds with the mean draught of the ship on the Atlantic trip—32ft. 9in., making the displacement 37,000 tons. The course fixed upon was between the Corsewall Lighthouse next to the mouth of Loch Ryan, and the Longship Lighthouse at the west of Land's End in Cornwall, through the Irish Sea and St. George's Channel. The distance between these two points was determined by bearings on the compass, and worked out to 303 miles. The first run was begun almost exactly at midnight on a Monday, and before noon on the Tuesday the course had been covered. The speed averaged 26·4 knots. The vessel at once turned and entered upon the northward course, reaching the Firth of Clyde soon after midnight, in the teeth of half a gale. The mean speed was 24·3 knots, or an average for the 24 hours' steaming of 25·35 knots. The ship again headed south, and mid-day found her once more at Land's End. The time taken differed only by two minutes from that occupied in traversing the same 300 odd miles on the preceding day. The speed was 26·3 knots. On the return run over the course the rate was 24·6 knots, notwithstanding that the head wind had again freshened after nightfall. This gave a mean speed of 25·4 knots for the 1,200 odd mile test, and, as the conditions of the loading, machinery, and more or less those of weather, approximated to Atlantic experience, it is certain that the contract requirement of 24·5 knots on the Atlantic will easily be exceeded. There has never been any doubt as to this since the vessel had her first spin on the Clyde. The uniformity of the speed on the two runs south, and again on the two trips north, indicates the sufficiency and continuity of the steam supply from the boilers, which were never forced up to the comparatively low air pressure permitted by the contract. The turbines worked regularly and efficiently, and varied very little on either side of the mean revolutions of 188 per minute. As a sequel to this trial the vessel early on the Thursday began the second speed test provided by contract, two runs in each direction between Corsewall Light and the Chicken Rock. As already stated, the distance is just over 59 miles. Steaming south, with the machinery working in perfect harmony, she made the first run at a speed of 25·7 knots, the tide being with the ship. On the northward run the tide made a difference, the speed being 26·2 knots. This gave a mean of 26·45 knots, a magnificent achievement.

There were further speed trials so that the Cunard Company might have *data* as to the relation of the machinery power and speed at various draughts, because in such large ships the immersion steadily decreases owing to the depletion of coal and stores during the progress of the Atlantic voyage. There were also at intervals between the speed runs opportunities for testing the steering qualities of the ship. Each test only served to establish further her all round efficiency. The vessel was as satisfactory in steering as in steaming.

From first to last the vessel covered well over 2,000 nautical miles, and for the greater part of the time was exceeding 25 knots, with the machinery varying between 62,000 and 68,000-horse power—50 per cent. more than in any steamer on the ocean. Nevertheless, the work in the extensive machinery compartment throughout the trials was carried out, as

Home. one of the experienced observers put it, "with uninterrupted mechanical precision." This was in part the consequence of efficent organization in the engine room, but far more significant influences were the extensive experience, the careful calculation, and the trustworthiness of research which were brought to bear on the design of every detail, and which have culminated in an unqualified success worthy of the best traditions of the Cunard Company and of the builders, John Brown and Co. (Limited), Clydebank.

France. The following are the principal appointments and promotions which have been made:—Rear-Admirals—M. P. De Fauque de Jonquières and L. Barnaud to Vice-Admirals. Capitaines de Vaisseau—E. A. Papaïx to "Bouvet"; F. M. Lahalle to "Desaix." Capitaines de Frégate—M. E. Tirard to "Galilée"; J. Delguery de Malavas to "Lance" and Command of 2nd Ocean Torpedo Flotilla; E. J. Campardon to "Vaucluse."—*Journal Officiel de la République Française.*

The court-martial assembled at Brest under the presidency of Rear-Admiral Le Pord for the trial of Capitaine de Frégate Barbin, late of the cruiser "Jean Bart," for the stranding and loss of his ship on the West Coast of Africa, has by 5 votes to 2 found him guilty of imprudence, and sentenced him to be deprived of a command for three years and expenses.

General.—The first-class battle-ship "Démocratié," built at Brest, is now the fastest French battle-ship. On her official three hours' trial off Douarnenez on 18th July she averaged 19·44 knots, being nearly 1¼ knots more than the estimated speed. Her trials were continued during the month of July, giving also most satisfactory results at lower powers, including a speed of 17·3 knots at three-fifths power.

The Explosion on Board the "Iéna."—We have already published the finding of the Commission of the Senate on the explosion on board the "Iéna." The Commission of the Chamber has now also made its report as follows:—

"1. The Commission throughout its investigations has not found any evidence that B powder was the cause of the explosion.

2. The Commission is unanimous in advising that the use of black powder be definitely abolished on board all men-of-war, and that the manufacture of powder be improved, with a view to obtaining greater stability and greater accuracy of fire."

It will be seen from the above that the conclusions arrived at by the Commission appointed by the Chamber are contradictory to those arrived at by the Commission of the Senate as regards the initial cause of the explosion by the deflagration of B powder. On the other hand, both Commissions are agreed as to the advisability of doing away with black powder.

Opium Smoking.—The Minister of Marine has issued a circular on the abuse of opium smoking, which is on the increase in the French Navy. He says: "My attention has been drawn to the habit of opium smoking indulged in by a certain number of officers. This hateful vice is particularly dangerous in the case of the Navy, because opium slowly annihilates the power of will and deadens the perceptive faculties

of those who indulge in it. It is therefore absolutely necessary to put a stop to the habit. Any officer who at any time is found to be manifestly under the influence of opium is to be immediately reported to me, and I will not hesitate to deal with the case in the severest manner.

France.

"Officers are also informed that not only is the smoking of opium strictly forbidden in all men-of-war, but also the introduction or retaining of any object used in the same. I shall consider the commanding officer to be personally responsible for the carrying out of this circular, which is equally applicable to everyone of all ranks of the Navy."

Launches.—The launch of the new first-class battle-ship "Verité" took place on the 28th May from the Chantiers de la Gironde at Bordeaux, and she is the last of the six battle-ships of the so-called 1900 Programme to take the water. She was, however, launched in so advanced a state that she will very shortly be ready for sea; no large battle-ship, as a matter of fact, has ever before been launched in a state so approaching completion as she has been. In all important essentials the ship was finished, the turrets, engines and boilers, funnels, armour and the military masts being in place, the internal fittings completed. The only thing wanting being the guns, steam even was raised in the boilers. The launching weight of the ship was 12,250 tons, and some misgivings were felt as to the wisdom of launching so heavy a weight, as the roadway separating the building slip from the river was of doubtful solidity, so from the special engineering point of view the launch presented a problem of special interest. Every precaution, however, was taken, the ship rested on three cradles, and over 12,000 kg. (26,000 lbs.) of tallow were expended on greasing the ways, and the launch went off without a hitch, and presented an imposing spectacle as the huge mass, apparently ready for sea, with the smoke issuing from her funnels, glided majestically into the Garonne, where she brought up in mid-stream. The ship is expected to proceed shortly to Brest for her trials.

Her principal dimensions are as follows:—Length, 439 ft.; beam, 79 feet 6 inches; displacement, 14,870 tons, with a draught of 27 feet 2 inches. Protection is afforded by a complete water-line belt of hard steel, rising 8 feet above the water-line, 11 inches thick at water-line, and 9 feet 3 inches at top, tapering to 7 inches at the bows and to 5·5 inches aft. Main belt on bow reaches to 9 feet 9 inches below water; upper belt on bow to 8 feet 3 inches above water, tapering to 3 inches in thickness. Upper protective deck on top of belt, 2·4 inches thick; lower protective belt, 2 inches on flat, 2·8 inches at end. Heavy gun turrets, 12·8 inches; secondary turrets and casemates, 6·3 inches.

The armament consists of four 12-inch 45-calibre guns, two in each turret, one forward and one aft; ten 7·6-inch and eight 3·9-inch Q.F. guns, with twenty-four 3-pounders; five torpedo-tubes, of which three are behind armour, and two submerged.

There are three sets of engines, which are to develop 18,000-I.H.P., giving a speed of 18 knots. Steam is generated by twenty-two Belleville boilers; only coal will be used, of which there will be a normal stowage of 925 tons, increased in emergency to 1,825 tons, giving a radius of action of 8,390 knots at 10-knot speed. The total cost of the ship will be £1,654,200.

The Chantiers de la Gironde have received the contract for the construction of the new 18,400-ton battle-ship "Vergniaud," work on which is to be immediately commenced, but she is to be launched at a much earlier stage of her construction than the "Verité" has been.

France. The destroyer "Corquois" was launched at Rochefort on 27th June, having been commenced on 10th July, 1905.

Her dimensions are: Length, 58 metres (190 feet); beam, 6.20 metres (20 feet); tonnage, 335; H.P., 6,800; speed, estimated, 28 knots. She carries one 65-mm. (2·5-inch) and four 47-mm. (1·8-inch) guns, and two torpedo launching tubes. Her complement is fixed at 4 officers and 58 men, and she is to be ready for trial in the first quarter of 1908.

The submarine "Rubis" and submersible "Q51" have been launched at Cherbourg. The "Rubis" is of the "Emeraude" class, of which there are six. "Q51" is the first of two submersibles whose dimensions are: Length, 51.12 metres (167 feet); beam, 4.97 metres (16 feet); tonnage, 398; motor H.P., 700; speed, 12 knots. They will have seven launching tubes for torpedoes, and their complement is fixed at 2 officers and 22 men.

Accident to a Submarine.—Another accident to a submarine, somewhat similar to that which damaged the "Gymnote" at Toulon, has happened to the new submarine "Rubis" at Cherbourg.

The "Rubis" was being tested for watertightness, but when the water was admitted to the dry dock in which she was lying, the workmen on board reported that it was rapidly filling the vessel. The inlet valves of the dock were immediately closed, but not before the electrical machinery had become submerged, and in consequence so much damaged that it will have to be removed and sent to the manufacturers for repair.—*Le Temps*, *Le Yacht*, and *Le Moniteur de la Flotte*.

Germany. The following are the principal promotions and appointments which have been made: Vice-Admiral—Von Prittwitz und Gaffron to Admiral. Kapitäns zur See—Poschmann to be Second-in-Command of 2nd Squadron of the High Sea Fleet, with rank as Commodore; Schröder to Command of 1st Dockyard Division; Grapow for service at the Ministry of Marine; von Dassel to "Pommern"; von Dambrowski to be Director of the Naval Academy.—*Marineverordnungsblatt*.

At present it takes from thirty-three to thirty-four years' service for an officer to reach the rank of rear-admiral, and in view of the increases to be made in the *personnel* of the Officers-Corps between now and 1920, it does not appear that there will be any danger of stagnation in the flow of promotion. By 1920 there are to be added to the present lists, 2 admirals or vice-admirals, 7 rear-admirals, 49 captains, 95 frigate- and corvette-captains, 262 captain-lieutenants, and 1,448 lieutenants, raising the number of commissioned officers of the military branch from 1,455 to 2,520.

New Ships.—In order to guard the German Navy against submarine catastrophes, such as have occurred both in the English and French Navies, the Admiralty are having a vessel built at the Howaldt Yard at Kiel, which is to act as a combined salvage ship and dock. The vessel consists of two parts, each of which is like the half of a ship, with a crane capable of lifting a weight of 500 tons between them. Should it

Germany.

be necessary to raise a submarine, the vessel would be opened out and placed in position over the submarine, and the crane brought into operation. When the boat is high enough, the two parts of the vessel will be brought together, forming a dock either for repairing the submarine or for bringing it into port. The ship is to be fitted with primary steam engines, which will give her a speed of 11 or 12 knots, and provide the necessary electrical energy for working the crane. She is to be ready by the spring of next year.

The new submarine "U1" has been carrying out her trials so successfully that another one of the same type is to be laid down immediately. It is now certain that only the two small cruisers, Ersatz "Pfeil," which is being built at the Imperial Dockyard, Keil, and Ersatz "Komet," which is being built by Blohm and Voss, in Hamburg, will be launched this year. Each of these vessels will have a displacement of 3,600 tons, and a speed of 24 knots. Neither of the two 19,000-ton battle-ships, the Ersatz "Bayern" and the Ersatz "Sachsen," building at the Imperial Dockyard, Wilhelmshaven, and the Weser Yard, Bremen, respectively, will be ready to take the water before next spring; nor will the monster 17,000-ton cruiser "E," which is being built at the Imperial Dockyard, Kiel, be ready for launching before that date. The two 19,000-ton battle-ships of this year's programme, the Ersatz "Württemberg" and the Ersatz "Baden," are being built at the Vulcan Yard, Stettin, and the Germania Yard, Kiel, respectively.

The Ministry of Marine have given orders that a third destroyer, one of the group "V 150—V 161," under construction at the Vulcan Yard, Stettin, is to be fitted with turbine engines on the Curtis system. The first boat to be fitted with turbines was "S 125," one of a group built in 1904, by the Schichau Firm at Elbing, which had a displacement of 470 tons, and a speed of 28·5 knots, her turbines were on the Parson's system. The second, also fitted with Parson's turbines, is "G 137," built at the Germania Yard, Kiel; she has a displacement of 570 tons, and at her recent official trials attained a speed of over 32 knots, or more than two knots over the contract speed. She will probably form the model for a division of similar vessels.

The Widening of the Kaiser-Wilhelm Canal.—The Government have carried their Act providing for the widening of the Canal. The widening became necessary when the Government at the end of 1905 determined on increasing the displacement of the new battle-ships to 18,000 tons, and of the new cruisers to 15,000 tons, as it would be impossible for them to pass through the present locks. In 1906, the Reichstag voted 100,000 marks (£5,000) for the preliminary studies for carrying out the work, and the commission appointed for the duty sent in their report at the end of last year, in which they pointed out that not only would new locks be required, but that the canal itself must be enlarged in view of the military and strategical necessities of the case, and also for facilitating and developing the commercial traffic.

The proposed plans have been approved by the Kaiser, and the money voted by the Reichstag, and the work is to be taken in hand at once.—*Neue Preussiche Kreuz Zeitung.*

The Personnel of the Fleet: The Officers' Corps. — The following are the numbers of the officers of different ranks on the Active List of the Fleet: 5 Admirals, 11 Vice-Admirals, 18 Rear-Admirals (a total of 35 Flag

Germany. Officers), 72 Captains, 32 Frigate-Captains, 132 Corvette-Captains, 387 Captain-Lieutenants, 798 Lieutenants, 417 Midshipmen, and 193 Naval Cadets.

There are, further, 2 retired Rear-Admirals, 10 retired Captains, 19 Retired Frigate- and Corvette-Captains, and 7 retired Captain-Lieutenants employed on special duties, while 45 Captain-Lieutenants and 81 Lieutenants are employed in ordnance and torpedo duties in the various dockyard and coast stations.

The total number of commissioned officers of the military branch actively employed is thus 1,640, as against 1,470 last year.

The Staff of the Marine battalions is as follows: 1 Inspector of Marine Infantry, 1 Lieut.-Colonel, 4 Majors, 21 Captains, 25 First Lieutenants, and 34 Lieutenants.

The Marine Field Artillery have 2 Captains and 6 Lieutenants, and the Pioneer detachment 1 Major and 2 Senior Lieutenants.

The Engineering Department consists of 9 Chief Engineers and Senior Staff Engineers, 52 Staff Engineers, 89 Senior Engineers, and 154 Engineers, being an increase of 36 over the numbers of last year.

The Medical Department consists of 1 Medical Director-General (with the rank of Rear-Admiral), 4 Inspectors-Generals, 53 Fleet-Surgeons, 89 Staff-Surgeons, 52 Surgeons, and 49 Assistant-Surgeons.

In the Accountant Department are 48 Staff-Paymasters and 155 Senior Paymasters and Paymasters.

Seamen, Stokers, etc.

The Seamen's Divisions number 122 Chief Warrant Officers, 199 Warrant Officers, and 17,226 Petty Officers and seamen, with 96 Boys' Instructors and 1,404 boys—a total of 19,047, showing an increase of 11 Chief Warrant Officers, 16 Warrant Officers, 1,051 Petty Officers and seamen, 48 Boys' Instructors, and 352 boys.

The Dockyard Divisions number 329 Chief Warrant Officers, 659 Warrant Officers, and 12,428 Petty Officers and men, of whom 882 Chief and Warrant Officers and 10,135 Petty Officers and men form the Engine-room *personnel* of the Fleet, which shows an increase of 49 Chief and Warrant Officers and 550 Petty Officers and men over last year, with a total increase in the divisions of 50 Chief and Warrant Officers and 693 Petty Officers and men.

The Torpedo Divisions number 100 Chief Warrant Officers, 198 Warrant Officers, and 5,217 Petty Officers and men, of whom 56 Chief and Warrant Officers and 2,400 Petty Officers and men are of the seamen class, while 242 Chief and Warrant officers and 2,817 Petty Officers and men are of the engineering branch. There is an increase in the divisions of 17 Chief and Warrant Officers, and 304 Petty Officers and men of the engineering branch, and of 4 Chief and Warrant Officers and 254 Petty Officers and men of the seamen branch, or a total increase in both branches of 21 Chief and Warrant Officers and 558 Petty Officers and men.

The Seamen Artillery Division and Mining Detachment numbers 24 Chief Warrant Officers, 45 Warrant Officers, and 3,196 Petty Officers and men, of which 11 Chief Warrant Officers, 21 Warrant Officers, and 631 Petty Officers and men belong to the Mine Division. There is a total increase of 12 Chief Warrant Officers, 21 Warrant Officers, and 297 Petty Officers and men over last year, of which increase 11 Chief Warrant Officers, 8 Warrant Officers, and 180 Petty Officers and men are due to an increase in the staff of the Mine Detachment.

Germany. The Marine Infantry numbers 191 Non-commissioned Officers and 1,038 men—a similar strength to last year.

The Sick Bay Staff consists of 472 Petty Officers and men of various grades, being an increase of 34 over last year; and there are 329 ship's stewards, writers, and assistants.

The sum total of all ranks is 46,950, being an increase of 3,296 as compared with 1906.

Personnel.	Officers.	Non-commissioned Officers and Seamen.				Total all Ranks, 1907.	Increase compared with 1906.
		Warrant Officers.	Petty Officers.	Seamen.	Boys.		
Naval Officers	1,587	—	—	—	—	1,587	76
Junior Executive Officers	—	—	378	175	—	553	—
Engineer Officers	295	—	—	—	—	295	26
Seamen, Boys, Dockyard and Torpedo Divisions ...	—	1,607	8,002	26,809	1,500	37,918	2,740
Seamen Artillery	—	69	415	2,781	—	3,265	330
Marine Infantry	50	—	191	1,038	—	1,279	5
Personnel of the Clothing Department	—	—	25	200	—	225	—
Medical Department	234	—	199	273	—	706	42
Artillery Administration	78	103	60	—	—	241	12
Torpedo *Personnel* (Technical and Administrative) ...	49	112	48	—	—	209	10
Mining *Personnel* (Technical and Administrative)	22	35	55	—	—	112	20
Accountant Department	—	79	206	44	—	329	12
Surveying „	—	28	—	—	—	28	—
Total	2,315	2,033	9,579	31,320	1,500	46,747	3,273
		44,432					

To which have to be added 203 Paymasters, not included in the above, bringing the grand total up to 46,950—a total increase compared with 1906 of 3,296.

—*Etat für die Verwaltung der Kaiserlichen Marine auf das Rechnungsjahr, 1907.*

United States. *Naval Construction and Repair.*—The annual report of Washington L. Capps, Chief of the Navy Bureau of Construction and Repair, with rank of rear-admiral, is a pamphlet of ninety pages, giving in detail the work of this important bureau. He modestly requests for the support of his bureau 5,016,914 dollars less than last year, the decrease in the number of vessels under construction leading to a prospective decrease in the appropriations for the bureau as follows:—30th June, 1906, 30,410,833 dollars; 30th June, 1907, 17,830,829 dollars; 30th June, 1908, 12,713,915 dollars.

"Extracts from reports of naval constructors at Navy Yards would indicate that there is still considerable room for improvement at our various naval stations. Many of these improvements are in the nature of minor changes necessary for the adaptation of existing conditions to meet the requirements of an enlarged fleet. Others involve extensive changes or additions which, though desirable, are not absolutely necessary."

United States.

The bureau has in the majority of instances been compelled to disapprove the recommendations of naval constructors for such improvements, and in its recommendations to the Bureau of Yards and Docks for such new construction, has confined itself to such structures only as might be regarded as urgently important in view of the rapid increase in the requirements of the fleet.

As noted in previous reports, additional dry dock accommodations, pier facilities, and water front are becoming urgently necessary at many of our naval stations, the most notable instances being New York, N.Y., Portsmouth, N.H., and Norfolk, Va. The absence of suitable pier facilities will make it impracticable to fully utilise the large new dry dock at the Navy Yard, Portsmouth, N.H., so that additions to the wharf frontage and pier facilities are of the utmost importance there.

It will be some time before the new docks at New York, Norfolk, Charleston, and Mare Island are available. The first three of these cannot accommodate the proposed battle-ships unless their length is limited to 520 feet. It is recommended that provision be made for an additional dry dock capable of docking the largest vessels at the Navy Yard, Norfolk, Va., and the Navy Yard, Pensacola, Fla.; also that provision be made for enlarging and rebuilding dry dock No. 3 at the Navy Yard, New York, in order that such rebuilding may be promptly undertaken as soon as dry dock No. 4, now under construction, is available for the docking of battle-ships. The New York Yard should be developed so as to meet the requirements of war. Higher pay is required to secure civilian employés for the unattractive service of the Philippines.

"The bureau sees no reason to change its opinion, previously expressed, with respect to the relative cost of building new vessels by contract or in Navy Yards, the record of many years past indicating clearly that the cost of contract-built vessels should be less than that of similar vessels built in Government Navy Yards, by reason of the shorter hours of labour, paid holidays, leave, etc., granted to Navy Yard employés." The officers, mechanics, and other employés of the Navy Yard, New York, are congratulated upon the character, comparative economy, and speed of execution of work connected with the construction of the "Connecticut" at the Navy Yard, New York, having due regard to the difficulties under which such work was undertaken and prosecuted.

Though the casualties in the construction corps continue large, it is hoped that the loss may ultimately be made good by the assignments of graduates from the Naval Academy. The continued resignation of civilian employés is embarrassing, and inducements should be given to the experienced ones to remain.

Work on designs for three torpedo-boat destroyers has been commenced, and a large amount of miscellaneous design work has been undertaken or completed in connection with smaller vessels, yard craft, etc. The model tank at the Washington Yard amply justifies its existence, the gain in the efficiency of the vessels of the "South Carolina" class being alone sufficient to pay for the expenditure on it during the year, which has been lessened by the amount paid for its use by private shipbuilders.

Ninety-five vessels have been surveyed and repairs authorised during the year; 118,634,250 lbs. of steel have been inspected, eighteen vessels have been added to the Navy, and three dropped; ten battle-ships, six armoured cruisers, three scout cruisers, and four submarine torpedo-boats are building under contract, and a battle-ship, two training-ships,

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two colliers, and two sea-going tugs at Navy Yards. The "Idaho," "New Hampshire," and "Kansas" have been launched since the last report. It is recommended that the useless ram "Katahdin" be sold.

Trials.—The new first-class battle-ship "Connecticut," completed her final trial trip on 9th August, successfully. Rear-Admiral Evans, whose flagship the "Connecticut" is, was quoted as follows regarding the trial: "It was a great success. I have witnessed many speed tests, but I do not recall a trial that pleased me more than the present four-hour run. The ship did everything I expected of her, and more, and I think the average speed of 18·873 knots for the four hours, and the measured mile in 19·01 would have been excelled had the quality of the coal been better. The "Connecticut" demonstrated that she has a consistent sea speed of eighteen knots. Her engines ran smoothly and she slipped through the sea at full speed without vibration."

The trial tests of the "Connecticut" and the "Louisiana" compare as follows: Trial draught, "Louisiana," 24 feet 6 inches; trial draught, "Connecticut," 25 feet. There was a difference of 384 tons in weight between the two vessels, as for every inch additional draught sixty-four tons has to be reckoned. The difference in this case means between three and four-tenths of a knot an hour in favour of the "Louisiana." The following table shows the average speed per hour for the four-hour runs for both vessels:—

"Connecticut"	18·87 knots
"Louisiana"	18·82 knots

Average speed per hour during five high-speed runs:

"Connecticut"	18·73 knots
"Louisiana"	18·594 knots

—*U.S. Army and Navy Journal.*

MILITARY NOTES.

Home.

The following are the principal appointments which have been made:—

Lieutenant-Generals—Sir H. M. L. Rundle, K.C.B., K.C.M.G., D.S.O., Commanding-in-Chief, Northern Command, to be Colonel Commandant, Royal Artillery.

Colonels—H. M. Sinclair, from an A.Q.M.G., to be an A.A.G. A. G. Dallas, to be Commandant of the School of Musketry in South Africa. R. W. M. Jackson, C.M.G., Ordnance Officer 2nd Class, to be an Ordnance Officer 1st Class, with the substantive rank of Colonel in the Army. E. G. Nicolls, R.A., to be a Chief Instructor in Gunnery.

Memorandum on the Militia and Yeomanry.—The following Memorandum on the Militia and Yeomanry was issued on the 22nd August as a Parliamentary paper.

(*a*).—*Militia.*

1. Of Officers below the rank of Lieutenant-Colonel in the 3rd and 4th Battalions not more than one-half in each rank will be regular officers.

Home. There is no intention of making anything like one-half of the subaltern officers of these battalions regular officers.

2. The question of the organisation of the Artillery of the Special Contingent is one of great intricacy, but much work has already been done on it and considerable progress has been made. It seems probable that these Artillery Special Reservists will be organised in units, and in that case they will have their own officers, who will have promotion in their units as at present.

3. As regards the establishment and numbers of the 3rd and 4th Infantry Battalions there is to be equality, and both the 3rd and 4th Battalions will have a chance of being used as units in war as well as of supplying drafts.

4. In Ireland it is proposed to maintain 20 Special Contingent Battalions out of a total of 28 existing Militia Battalions. In Great Britain it is proposed to maintain 81 battalions out of a total of 96 existing Militia Battalions. The remaining battalions, viz., 8 in Ireland and 15 in Great Britain, will, as regards both officers and militiamen, be absorbed, if they so consent, into the battalions which it is intended to maintain, and they will accordingly disappear as battalions.

5. A special reservist will be entitled to enlist in a particular battalion, if under Establishment, and will, in peace time, not be posted to any other battalion without his consent.

6. All Officers will be offered transfers to the Special Contingent for service as Reserve Officers—in the case of the Militia Infantry with the 3rd or 4th Battalions, and will be posted to those battalions. The Majors of Militia battalions will, if they are considered qualified, be available for promotion to Lieutenant-Colonels to command battalions.

The Lieutenant-Colonel to command a 3rd or 4th Battalion will be taken either from Majors of the Reserve of Officers serving in their battalions, if considered fit to take up the command of a battalion, or from a retired Regular Officer.

All the officers serving in the 3rd and 4th Battalions as Reserve officers will receive £20 in addition to pay up to the age of 35. On reaching the age of 35 they cease to draw the £20 per annum, but they may, if they so desire, remain in the 3rd or 4th Battalions as Reserve officers, and will be eligible for promotion up to the rank of Lieutenant-Colonel in those battalions. Captains, now serving in the Militia, of over 35 years, can remain in their battalions if they wish as Reserve officers. They will be eligible for promotion up to the rank of Lieutenant-Colonel, but they will not receive the £20 per annum.

7. When the Special Contingent are employed on active service abroad, an order under Clause 29, Sub-section 5, of the Territorial and Reserve Forces Bill will be issued as soon as practicable after the conclusion of hostilities, under which all special Reservists serving with the Colours will be returned to civil life, so far as is practicable, simultaneously.

8. So far as is practicable, when special Reservists are ordered abroad on active service, their own officers will go with them.

(*b*).—*Yeomanry.*

1. In the case of the Yeomanry it has been decided to increase the emoluments of non-commissioned officers and men who will draw the new rate of pay. In addition to Army pay of 1s. 2d., camp allowance of 1s., and ration allowance of 6d. already announced, every non-commissioned officer or man present at training who is certified to be efficient in equitation will receive an equitation bounty of £1 as an addition to the new rate of pay.

Home. 2. The Yeomanry Commanding Officers Committee, with General Mackinnon, Director of Auxiliary Forces, and General Haig, Director of Military Training on the General Staff, have been invited, under the presidency of Lord Scarborough, to consider the future arrangement for the training and management of the Yeomanry.

Belgium. *Organisation and Recruiting of the Congo Forces.* — The Belgian Press has recently published a report of the Higher Administration to the King on the general situation in the Congo Free State. Similar reports were published in 1891, 1897, and 1900. From this document the following information regarding the organisation and recruiting of the forces is extracted :—

"The Government," says the report, "has not ceased to interest itself in these forces, and it is thanks to the persevering methodical efforts it has adopted for twenty-two years that it has succeeded in organising a disciplined national army capable of preserving order in the whole district. . . . The Government in creating a national force rescued a portion of the population from barbarism. As the Commission of Enquiry has stated, natives during their service with the colours, learn respect for authority and the example of duty, assimilate the principles of discipline and good conduct, and return to their homes, in a certain measure, as the propagators of a more advanced civilisation."

The duration of active service is for 7 years; the annual contingent is 3,000 men, Militia and Volunteers; the effective is 14,000 men. Organised for the first time in 1888, the forces at the present time consist of :—

1. Twenty-three Regular companies, distributed amongst the districts. The greater portion of the company are in garrison at headquarters; the remainder is distributed in detachments amongst various posts of the district.

2. Three camps of instruction, whose object is to carry out the moral education as well as the military training of the men of the new levy.

3. A reserve corps, capable of being rapidly organised, so as to respond to urgent necessities.

4. A school for candidate sergeants for training black non-commissioned officers necessary for the good administration of units.

5. A school of black armourers for the formation of assistant-armourers for keeping the company armament in good condition.

The detached companies return periodically to headquarters. Each of them contain men of various origin. Each company, commanded by an officer, contains a number of non-commissioned officers, European and native, varying with the importance of the district where it is stationed, which is fixed by the Governor-General of the Congo. The company is divided into half companies of 50 men, each under the orders of an officer or non-commissioned officer. The half company is divided into two sections, commanded by a native sergeant, 1st sergeant, or sergeant-major; the section consists of two squads, each commanded by a corporal. Natives cannot reach higher rank than that of sergeant-major; they are appointed to that rank, as well as to that of 1st sergeant by the Governor-General; the District Commander may appoint them to the rank of sergeant and corporal.

The officers are recruited from officers of the European Regular or reserve forces, and from under-officers who, after serving for at least

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three years in Africa, and having there passed a practical examination, have also gone through a scientific examination at Brussels.

The under-officers are also recruited from under-officers of the Regular Army. Those not fit to be nominated sub-lieutenants, but who are otherwise deserving, are promoted to positions in the pay department.

In order that private soldiers on leave may have some ready money on returning home, the Government grants them, in addition to their daily rate of pay, a monthly reserve allowance, which is given them when they leave the Service.

Finally, assistance is given to widows of deceased soldiers, as well as to men discharged in consequence of illness contracted in the Service. The Government also favours the giving of billets round the stations to old soldiers.

The whole of the forces are under the orders of a field officer. He has under him a staff of three captains specially charged with the permanent inspection of companies and camps. In addition to the conscripts enrolled each year, the Congo annual contingent includes a second section for the purpose of training workmen for large public works, "of which the natives themselves will reap the immediate benefit, such as the construction of railways and roads."

This section in 1907 should consist of 2,550 men; the total annual contingent, therefore, including Militia, Volunteers, and workmen, is this year 5,550 men.—*Revue Militaire des Armées Etrangères.*

France.

Military Colleges and Schools. — The following are the principal military educational establishments:—

Ecole Superieure de Guerre.—This war college is meant to develop the higher branches of study in the Army, and for the recruiting of officers for service on the Staff. It was formed by a decree of the 15th June, 1878, and organised in the central portion of the Military School of the Champ-de-Mars. Officers of all branches of the Service (captains and lieutenants) who have served for five years in the commissioned ranks, three of which have been actually passed with their regiments, are admitted to it. The course lasts for two years. The average number of officers admitted each year is 100. A Staff certificate carries with it a seniority of six months for promotion by selection.

Ecole d'Application de Cavalerie.—The Cavalry School at Saumur was specially instituted to:

1. Perfect the instruction of lieutenants nominated to follow the course.
2. Complete the instruction of newly promoted sub-lieutenants.
3. Give non-commissioned officers desirous of obtaining commissions, the general knowledge which every officer should possess.
4. Complete the technical instruction of newly admitted probationary assistant veterinary surgeons, teach them riding and regimental duty. For all the divisions, with the exception of telegraphists and fencing-masters, the duration of the course is 11 months. The school receives, in addition: 1, Assistant fencing instructors of regiments; 2, men from cavalry regiments for a course of farriery; 3, men detached

France. from their cavalry regiments to be exercised in electric and optical telegraphy. Candidates must have at least two years' service as non-commissioned officers. After an examination before a regimental board, to obtain a certificate of general instruction, these non-commissioned officers are entered on a list for promotion to the rank of sub-lieutenant, by the Inspector-General.

Ecole d'Application de l'Artillerie et du Génie.—This school trains officers for corps of Home artillery and for corps of Colonial artillery and engineers. Pupils from the *Ecole Polytechnique*, who are considered fit, on leaving that establishment, to serve in one of the branches of the Service mentioned above, must first put in a year's service as sub-lieutenant in a regiment. To compensate for the time devoted by the pupils to this training, four years of preliminary study is allowed to each of them. These four years are reckoned as effective service. They then go through, either as students or as lieutenants, a course at the *Ecole d'Application de l'Artillerie et du Génie* in order to give them both the necessary technical instruction, and a thorough training in military duties and in riding. The *Ecole d'Application* receives, at the same time, a certain number of lieutenants and young captains of artillery, both home and colonial, and of engineers who come in order to go through a technical course so as to acquire a thorough knowledge necessary for duties in establishments, or special staffs. Finally some officers from the *Ecole Militaire de l'Artillerie et du Génie* are allowed to go through the courses. A decree published on the 8th August last, transferred the *Ecole d'Application* to Bourges, and changed its name to *Cours Supérieur Technique de l'Artillerie.*

Ecole Polytechnique, at Paris, is specially designed to instruct for the following services:—Home artillery, colonial artillery, military engineers, colonial commissariat, powders and saltpetres, national marine, naval commissariat, corps of hydrographic engineers, naval engineers, roads and bridges, mines, posts and telegraphs, Government factories, forests and rivers, and other public departments, whose officials should have an extensive knowledge of mathematics, physics and chemistry. The duration of the studies is for two years. Students may be admitted to the above-named public departments when they have passed a final examination on leaving after two years' study. The admission of students to these public departments is also contingent on the vacancies available when they leave the school, on their classification on the list in order of merit and by their physical capacity. The annual payment for board is 1,000 francs (£40), and that of the outfit about 600 francs (£24); 100 francs must, in addition, be handed over to form an individual expense fund for each student. Admission to the school is only by competition, and no one may compete until he has first proved: I. That he is a Frenchman or a naturalised Frenchman. 2, That he is not less than 17 and not more than 21 years of age on the 1st January of the year he competes.

Ecole Spéciale Militaire de Saint-Cyr.—No one may attend this school who is less than 18 or more than 22 years of age. In compliance with Art. 23 of the law of the 21st March, 1905, on the recruiting for the Army, candidates finally admitted as the result of competition, are obliged, before attending the school, to serve in a regiment for one year under ordinary conditions. The programme of entrance examination is identical with that of the mathematical class A at the Government lycées and colleges as laid down by law.

France. *Ecole d'Application du Service de Santé Militaire*, at Val-de-Grâce.—This school takes in 2nd class assistant surgeons, probationary surgeons, 1st class military apothecaries, and surgeons and apothecaries of the Colonial troops. The course commences on the 1st of February and lasts 9 months.

Ecole du Service de Santé Militaire at Lyons is intended: 1, To ensure the recruitment of doctors for the Army; 2, to assist the university studies of students of the military medical service up to the grade of doctor and to facilitate their passage through the *Ecole d'Application* at Val-de-Grâce. Young men admitted to the *Ecole du Service de Santé Militaire* must serve with troops for one year, under ordinary conditions, before entering the school. On entering the school they contract an engagement to serve in the Regular Army for at least six years from the date of their appointment to the rank of 2nd class assistant surgeon.

Ecole Militaire d'Infanterie de Saint-Maixent.—The object of this school is to complete the instruction of infantry non-commissioned officers considered fit to be appointed sub-lieutenants. Admission is by competition from amongst non-commissioned officers. They must have two years' non-commissioned service and be regularly proposed by their immediate commanding officers. The non-commissioned officers thus brought forward undergo an examination, according to the results of which a list is made out of those admitted to the school. The period of the course is for one year. Student-officers who satisfy the examiners at the end of the year are classified in order of merit and immediately promoted to the rank of sub-lieutenant.

Ecole d'Administration Militaire, at Vincennes, trains non-commissioned officers of the Home Army and those of the Colonial Army, to be admitted, the former into the corps of administration, as officers of the commissariat, the medical department, the staff, recruiting of artillery and engineers; the latter into the administration corps of the Colonial commissariat and medical service. The non-commissioned officers are selected after a competitive examination. The school course is for 10 months.

Prytanée Militaire de la Fléche is a preparatory military school formed at Fléche for the free education for the sons of officers, and may also take in other children on payment of their board. This establishment is under military discipline. The instruction given at the *Prytanée* consists of the literary and scientific courses necessary to place the pupils in a position to obtain bachelors' diplomas of secondary instruction, and more especially to enable them to successfully compete at the entrance examination at the *Ecole Spéciale Militaire*. The pupils may also, by following the normal course of the classes, prepare themselves for the *Ecole Navale*. Pupils enter the *Prytanée Militaire* as foundation scholars, day-foundation scholars, or boarders, either in the 7th or in the classes following, after undergoing an examination, the conditions and form of which are laid down by ministerial instructions of the 26th December, 1906. Parents should enter the names of their children from the 16th April to the 15th May, at the prefecture of the department in which they reside. In this establishment the pupils are taught military exercises, fencing, gymnastics, swimming, and riding. There are 310 foundation scholars, 120 day foundation scholars, and 8 drummers, not counting day scholars and boarders for whom their parents pay. The fee for a boarder is 850 francs (£34) a year, for a day scholar 450 francs (£18), and the outfit costs about 360 francs (£14 8s.). The board payment is divided into 10 portions, payable in advance into the Government Treasury. Losses and delapidations due to the fault of the pupils themselves, are charged against them, and

France. for that purpose parents must pay in a sum of 35 francs before the pupil's admission. Admissions take place every year during the 4th quarter. The *Prytanée* does not receive pupils of less than 9 or of more than 16 years of age on the 1st January of the year of examination, exception is only made for holders of a university degree, who have not to undergo any examination. Pupils may not remain at the school after the 1st October of the year during which they attain the age of 19, at the same time the War Minister may allow those pupils to remain there, until their 21st year, who are in possession of a university degree, who appear to have a chance of successfully competing at the military schools, and who have shown themselves deserving of this favour.

Ecole des Sous-Officiers de Gendarmerie.—This school was created by a decree of the 3rd January, 1901, and is situated in the barracks of the Garde Républicaine, at Paris. It is meant to prepare, for the rank of sub-lieutenant, non-commissioned officers of the Garde Républicaine and of the departmental and Colonial Gendarmerie, who have at least two years' non-commissioned service and who have successfully passed the entrance examination. No non-commissioned officer can be appointed sub-lieutenant until he has gone through the courses and passed successfully out of the school. The course lasts for six months.

Ecole Militaire de l'Artillerie et du Génie, at Versailles.—This school receives non-commissioned officers of artillery, engineers, and military transports, who have at least two years' non-commissioned service on the 31st December of the year of nomination. The course is for one year, commencing on the 1st April. Pupils who satisfy the examiners on leaving the school are at once promoted sub-lieutenants.

Ecoles Militaires Preparatoires d'Infanterie.—There are four of these schools at Rambouillet Les Andelys, Montreuil-sur-Mer and Saint Hippolyte-du Fort. Their object is to make pupils fit to become good non-commissioned officers on leaving. The following may be admitted: Sons of soldiers, corporals, non-commissioned officers, who have contracted an engagement for at least 5 years, sons of officers up to the rank of captain inclusive, and sons of deceased field officers, and without any conditions of seniority, the sons of soldiers killed in action or who died of wounds. These children must not be less than 13 or more than 14 years of age on the 1st August.

Ecole Militaire Preparatoire de Cavalerie, at Autun.—The effective of this school is 400 pupils, who enter at the age of 13 and leave at 18 years of age. On leaving the school they are called upon to enlist for five years in any regiment they may select. Only sons of soldiers up to the rank of captain inclusive, or non-combatants of similar rank, and of deceased field officers, are admitted to the school. All admissions, without exception, are free.

Reorganisation of Non-Commissioned Officers' Schools.—An order of the 30th July last introduces important changes in the organisation of schools for cadet-officers of all branches of the Service, and makes the programmes, the regulations for admission and exit uniform as far as the special conditions of each arm permit. The report which precedes the order shows that there is no necessity for differences of organisation and administration and of methods of instruction, or for divergences of orientation and teaching. The object pursued at each of the schools renders them, as a matter of fact, absolutely comparable, except as regards the special technical teaching for each arm.

France. As a preparatory measure it would appear desirable, in the near future, that officers from the ranks having a higher standard of general knowledge, should be able to enter finishing schools with the same degree of preparation as their comrades who come from the special schools. The creation of these schools is a legislative affair, but whatever may be the final solution adopted by Parliament, the changes introduced by the order into the present method will help to found a homogeneous corps of officers.

Recruitment and Conditions for Admission. — The recruiting will be carried out as in the past, viz., non-commissioned officers considered fit to be appointed officers will be sent, as a rule, to the military schools of their branch of the Service, except as regards non-commissioned officers of mounted sections and troops who may attend, some the transport section of the Infantry Military School, and the others that of the school for cadet officers of artillery. Non-commissioned officers, to be admitted to the course, must have 2 years' service in their rank at the moment of entry to the school; they must also be in possession of a certificate of fitness for the duties of section or platoon commander.

The course is divided into 2 parts, with special examiners for each of them :—

1. General knowledge.
2. Professional knowledge.

The portion of the course dealing with general knowledge is judged by those correcting the papers (the same for all branches of the Service); the technical portion is submitted to the judgment of a board distinct for each arm.

Non-commissioned officers admitted continue as formerly to be borne on the rolls of a unit of their corps, but are, as far as possible, seconded, in order that they may be replaced in their corps. With regard to honours and exterior marks of respect, they have the same rights and duties as adjutants.

The pupils are divided into *brigades* of 20 to 25 at most; brigades placed under the command of a lieutenant or 2nd captain are grouped together, from 2 to 4 brigades, under a captain. The professors have, as a rule, the rank of captain. The course commences each year in October and ends in September of the following year. At the end of the course the cadet officers undergo practical examinations before a board appointed by the War Minister. They are classified in each school according to the results of this examination and the notes of the year on one single list for non-commissioned officers of the Home and Colonial Army. Cadet officers who fail to satisfy the examiners are sent back to a corps and given the same rank or employment which they had before going to the school. This sending back is obligatory, and can only be set aside when interruptions to study caused by ill-health, justify the authorities in allowing a second year's course. These regulations are only applicable to those entering the schools from 1909.— *L'Armée Française* 1907, and *Revue du Cercle Militaire.*

Italy. *The Grand Manœuvres.*—The following was the general idea for this year's Italian manœuvres :—

"A hostile force (Red), coming from the north, has crossed the Alps in the district between the Little Saint Bernard and the Saint Gothard. It advances in two columns by the valleys of the Doria Baltea and the

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Ossola. The national force (Blue) has concentrated its forces round Novara. Its object is to oppose the enemy's march and more especially to prevent the junction of the two columns."

For the carrying out of this scheme the commanders of both forces had complete liberty of action. The composition of the two forces was as follows :—

Red, commanded by General Mainoni d'Intagnano, consisted of 2 army corps, the Ist and IIIrd, each army corps being composed of 2 divisions. The total number of units attached to the Red Force was 16 infantry regiments (47 battalions), 2 bersaglieri regiments (6 battalions), 2 cavalry regiments (12 squadrons), 32 field artillery batteries (48 guns of the 87B and 70 of the 75A model, with rigid gun carriages), 4 engineer companies (2 sapper and 2 telegraph), an infantry machine gun section (for trial), and the other necessary departments and services.

Blue, under the command of General Rogier, consisted of an army corps, the IInd (of 2 divisions), an independent division, and a cavalry division. The total number of units of the Blue Force was 12 infantry regiments (35 battalions), 1 bersaglieri regiment (3 battalions), 1 cyclist company, 5 cavalry regiments (30 squadrons), 21 field artillery batteries (56 guns of the 75A and 24 of the 87B model), 1 battery of the 75 model 1906, 2 horse artillery batteries (8 guns with rigid gun carriages), 3 engineer companies (2 sapper and 1 telegraph), 2 cavalry machine gun sections (on trial), a balloon park, and all the necessary departments.

The two sides were reinforced by men recalled from furlough, and the units were consequently at about half war strength. The Red Force had about 1,500 officers, 32,000 men, and 6,000 horses, whilst the Blue Force consisted of 1,300 officers, 25,000 men, and 6,500 horses. If to these numbers are added detachments placed at the disposal of the director of manœuvres (1 telegraph company, 1 radio-telegraph park, 2 railway companies, and 1 automobile group), it may be stated that there were at leat 62,000 men in the theatre of operations, or 15,000 men more than at the last grand manœuvres in Campania in 1905.

The grand manœuvres of 1907, therefore, were of special importance, which was further increased by the appearance of a field battery of the latest type and of infantry and cavalry machine gun detachments.

In order to approach as closely as possible to the conditions of war, an endeavour was made to reduce to a minimum that conventionalism too frequently present in peace manœuvres. The director of the manœuvres, therefore, decided that from the moment the two forces took the field (the 27th August, at 6 p.m.) the commanders of the two forces should have complete liberty of action for the accomplishment of the missions with which they were entrusted. During action no signal was made to break off the manœuvre, which was carried out in conformity with the orders given by each commander and the decisions arrived at by the umpires. According as the action arrived at its complete development, or when it arrived at such a point as permitted the presumption of the final result, the umpires gave their decisions, and the troops went to their cantonments or bivouacked on their positions. The director of manœuvres, at the end of each day, took into consideration the umpires' decisions and the positions occupied, and determined the results of the day. The situation resulting served as a basis for the further development of the operations, which were not allowed to recommence before 3 a.m. To assist him in

Italy. overlooking the whole theatre of operations, the director was assisted by 20 general officers.

Each side had the following for carrying out its ration supply :—

1. An advanced magazine of daily rations and a park of beasts.
2. An advanced bakery.
3. A ration column, the carts for which were hired by the commanders of both sides.
4. Infantry and cavalry divisional subsistence sections.

Each day the troops of both sides received the following :—

1. From the advanced magazines : bread, dough or rice, bacon, salt, coffee, sugar, oats, and, when necessary, compressed hay.
2. From the subsistence sections : meat and, if possible, hay.
3. By purchase on the spot : wine.
4. By purchase by corps : all condiments except salt.

On the march and during manœuvres the troops received the following rations: beef, 8 ounces; dough or rice, 6¼ ounces: salt, ¾ ounce. The troops received in addition daily 2 rations of coffee with sugar, or if it could be procured on the spot, 1 ration of coffee and 1 ration of wine (about a quarter of a pint).—*La France Militaire.*

United States. *The Army.*—The present organisation of the Army is as follows :—

According to the Constitution, the President is Commander-in-Chief; he exercises his command through the War Minister and the Chief of the Headquarter Staff.

The Great General Staff consists of 1 lieutenant-general, 6 major-generals, and 15 brigadier-generals. To this number must be added the 11 brigadier-generals, chiefs of the 11 departments and bureaux, of which the War Department consists.

The Headquarter Staff consists of the Chief of the Headquarter Staff and 2 general officers selected by the President from the entire Army from amongst officers having at least the rank of brigadier-general, 4 colonels, 6 lieut.-colonels, and 12 majors, selected from the entire Army, and 50 captains, selected from all the officers of the Army holding the rank of captain and of first lieutenant. All these officers may remain in the Headquarter Staff for 4 years at most, after which they must return to their branch of the Service for at least 2 years before they can be again appointed to the Staff.

The Chief of the Headquarter Staff is the technical assistant of the Secretary for War. Under his direction officers of the Staff study all questions regarding the Army, its state of preparation for war, its organisation, distribution, equipment, armament, and the training of the men; they draft schemes and regulations, and exercise a supervision over the inspection and the military training of officers. They are specially charged with the preparation of places for defence and mobilisation, with the study of probable theatres of operations, and the intelligence service. They are divided into staff officers serving with the troops and staff officers at the War Department. The former are posted with general officers

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commanding the territorial divisions; the latter are divided into 3 divisions, each consisting of several sections.

The Army itself consists of :—

30 infantry regiments of 3 battalions of 4 companies;
15 cavalry regiments of 3 squadrons of 4 troops;
126 coast artillery batteries;
30 field artillery batteries;
3 pioneer battalions of 4 companies;
1 corps of signallers.

The effectives may vary, according to the law of 1901, between a minimum of 60,000 and a maximum of 100,000 men, according to the estimation of the President. At the present time the effective is 60,000 men and 2,554 officers. From this effective the following are detached :—

13,000 men to the Philippines;
2 cavalry regiments, 1 field battery, and 8 coast batteries to Cuba;
1 infantry regiment and 2 coast artillery companies to Porto Rico;
1 coast artillery company to Honolulu.

Recruiting.—The Regular Army is entirely recruited by means of voluntary engagements, under the following conditions and advantages :—

The American soldier enlists for 3 years. On first enlistment he must be between the ages of 21 and 25, be of sound constitution, and fulfil the conditions of height, weight and chest measurement required in all Armies. Married men may not be accepted without the concurrence of their future commanding officers. There is no bounty on enlistment or re-engagement, but only a monthly pay and additional monthly payments, which are given the man in excess of what is necessary for his maintenance, his lodging and his food. The monthly pay is 13 dollars for a private soldier, which increases according to rank up to 25 dollars for a 1st sergeant (infantry, cavalry, and artillery), and 36 dollars for a sergeant-major (engineers).

The additional monthly payments are the following :—

	Dollars.
After 2 years' service	1
„ 3 „ „	2
„ 4 „ „	3
„ 5 „ „	5
„ 10 „ „	6
„ 15 „ „	7
„ 20 „ „	8
„ 25 „ „	9
„ 30 „ „	10

Further, for clothing, the system of a soldier's fund is in force, which is very amply provided for, and which allows the soldier to effect considerable savings, which are given to him on discharge.

After 20 years' service or if discharged previously for wounds or for disease contracted in the Service, the soldier may be admitted to a military almshouse at Washington. After 30 years' service he is entitled to a pension equal to three-fourths of his Regular Army pay, increased by an allowance of 9 dollars 50 cents a month for food and clothing. Finally, to encourage thrift, the State gives an interest of 4 per cent per annum on soldiers' savings. In spite, however, of all these pecuniary advantages, the Army is recruited with difficulty, and

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although a soldier may break his engagement by a repayment of 120 dollars after 1 year, and of 80 dollars after 2 years' service, desertions are numerous, and amount each year to nearly 8 per cent. of the effective.

Militia.—In principle every American from 18 to 45 years of age is liable for service in the Militia in the event of national danger. The number of men liable to be enrolled, but not organised, is nearly 10 millions. The Militia, however, are not under the Federal Government, but are entirely dependent on the various States, the greater portion of whom are completely indifferent to military matters. The result is that the organised Militia only consists of from 8,000 to 10,000 men. Up to 1903 Militia units had an incongruous organisation, an out-of-date armament, and a generally inefficient training. The Militia law of 21st January, 1903, however, distinguishes between the organised Militia and reserve Militia. States are free to determine on the strength of their organised Militia, but the units constituted must be organised, armed and trained like the corresponding units of the Regular Army. Finally, the enlistment of organised Militia units in war time can only be carried out when the Congress has voted the creation of an army of Volunteers.

As regards the reserve Militia, nothing has up to the present been laid down for its enlistment, and its constitution is therefore extremely limited.

The United States Army, then, with its small effectives partakes more especially of the nature of an army cadre, the command, training, and armament of which may challenge comparison with those of the best European Armies, and would allow it, in case of necessity, to develop sufficiently to meet such requirements as it is possible, at the present time, to foresee.—*Armée et Marine.*

NAVAL AND MILITARY CALENDAR.

AUGUST, 1907.

6th (T.) French Marines were fired upon by Moors at Casa Blanca, 2 French cruisers bombarded the town.

8th (Th.) H.R.H. Field-Marshal the Duke of Connaught was appointed to a new command in the Mediterranean.

" " French Expeditionary Force landed at Casa Blanca.

10th (Sat.) Belfast Strike. Troops guarding carts were attacked by rioters.

11th (S.) Further outbreak of rioting in Belfast, troops and police were stoned.

12th (M.) Renewed rioting at Belfast. Police and troops charged rioters, of whom 2 were killed and several injured.

13th (T.) Troops were withdrawn from the streets in Belfast.

14th (W.) The text of a new Treaty between Japan and Russia was published.

15th Th.) Launch of first-class armoured cruiser "Bayan" from the Admiralty Yard, St. Petersburg.

" " The Belfast strike ended.

17th (Sat.) H.R.H. Field-Marshal the Duke of Connaught inspected the Belfast garrison and complimented the troops on their forbearance during the strike.

18th (S.) A battle was fought at Casa Blanca. 7,000 Moors attacked the French and were repulsed, with heavy losses after several hours fighting.
19th (M.) H.R.H. Field-Marshal the Duke of Connaught opened, in Dublin, a Memorial to the Royal Dublin Fusiliers who fell in South Africa.
24th (Sat.) Launch of first-class battle-ship "Temeraire" at Devonport.
" " Mulai Hafid was proclaimed Sultan of Morocco by some Moors.
28th (W.) The King's Artillery Prize was won at Lydd by the 1st City of Edinburgh Artillery Volunteers.
29th (Th.) 2nd Bn. Bedford Regiment left England for Gibraltar in the "Soudan."

Addendum to July Calendar.

27th (Sat.) Launch of first-class battle-ship "Bellerophon" at Portsmouth.

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval.* Buenos Aires: June, 1907.—"The Battle of Tsushima." "The Causes of and Means for Avoiding Fire at Sea." "The Hague Conference." "The Methods Employed in Boys' Training Ships for Instructing Apprentices for the Fleet." "A Contribution to the Study of Automobile Torpedoes."

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. 9. Pola: September, 1907.—"The Relations Between the Trajectories of Flat-Trajectory Guns" (*concluded*). "The Proceedings in the Italian Parliament on the Naval Estimates for 1907-08." "The Air Conditions and Consumption of Air in Submarines when Diving." "The Comparative Trials between the Submarines "Octopus" and "Lake" of the U.S. Navy." "The Japanese Armoured Cruiser "Tsukuba."" "Maritime Law Discussion at the Hague Conference." "Regulations Regarding the Organisation of the Superior Naval Council, Admiral-Committees and Committees for Consideration of Plans of Ships in the Italian Navy." "The Report of the Committee of Enquiry into the Causes of the Explosion on board the "Jéna.""

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: May, 1907.—"Safety at Sea." "Q.-F. Guns." "A Practical School of Artillery." "Pernambuco Harbour." "Guns" (*concluded*). "Evolution and Tactics of Artillery and Landing Operations" (*continued*). "Artillery Questions."

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Revista Científico-Militar y Bibliotéca Militar. Barcelona: August, 1907.—"The Question of Morocco." "Reform of the General Staff in Austria and Germany." "The Modern Tendencies in Tactics and Strategy." "The Employment of Machine Guns."

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UNITED STATES.—*Army and Navy Life.* New York: August, 1907.—"Porto Rico." "The Use of the Motor in War." "The War Wagon and Military Automobiles." "The Motor Driven Machine on the Battlefield." "Compensation for the National Guard." "Pro Gloria." "Field Training of Militia."

NOTICES OF BOOKS.

Napoleon's Conquest of Prussia, 1806. By F. Loraine Petre. London: John Lane, 1907.

The author states in his preface that there has been no detailed account of the downfall of Prussia, written in English, since the publication of the full information now available; but it is perhaps a matter of some regret that the very latest revised history of the Jena campaign by a well-known German writer has only just appeared—too late for Mr. Loraine Petre to avail himself of the information contained therein. The story of the ruin

and humiliation resulting from this campaign of thirty days is well told, and in some respects—from the point of view of a military history—it is a better work even than the "Campaign in Poland" which preceded it. The feeble, vacillating, selfish and dishonest policy which was responsible for the war is very clearly described in the opening chapter, wherein it is made tolerably clear that a policy of neutrality—neutrality under all and any circumstances—could not, and cannot, be secured by a military system rusty and out of date. The armies of the contending powers are admirably contrasted; that of Napoleon fresh from Ulm and Austerlitz, and with the fighting spirit of men and officers at its zenith—"in it was no conscript prematurely called up; there were no Spanish or Italian troops; the contingents of the German states took but an infinitesimal share in the operations before the complete destruction of the Prussian Army; the Dutch were only employed in an army of observation, on which no share of fighting fell, during the same period. Many of the French soldiers were veterans of Italy and Egypt." The marching powers of the French infantry were remarkable—not less so than their mobility in action. In artillery Napoleon was vastly superior, while in general organization and in the ability of his staff the Emperor had great advantages over his enemy. The Prussians slow, tied by exact formations and elaborate manœuvres, their tactics out of date, their army incompletely organized. But the causes of the great collapse are to be found on page 45, where the author quotes at length from the verdict of Von der Goltz. The plans of campaign of the rival armies are clearly explained, as are the preliminary movements up to the eve of Jena, and the anxieties of the Emperor on that eventful night; the two great battles and the extraordinary and almost—under the circumstances—criminally wilful failure of Bernadotte to co-operate with Davout. The fruits of the victory were plucked to the uttermost; if the pursuit did not, owing to Napoleon's ignorance of the stupendous character of the defeat by Davout—commence as soon as it might have done, once begun it was carried out relentlessly to the end—the practical annihilation of the Prussian armies. There can never, in the history of war, have been a pursuit which can be "compared for a moment to the hurricane which swept from the Thuringian forest to the banks of the Oder and the shores of the Baltic."

Mr. Loraine Petre has once more given us a book which should be read with pleasure and with profit by soldier and civilian alike, and it hardly needed the impressive words of the introduction to this work, written by Lord Roberts, to remind us that the lessons of this crushing campaign—lessons not of mere military training, of tactics, of the application of the principles of strategy—but the lessons which a nation may learn from the tragic fate of Prussia, of "the fate, amazing in its swiftness and appalling in its severity, which may at any moment overtake a state which exists in fancied security, based on traditions of a heroic past, and wrapped in a selfish indifference, hoping, ostrich-like, to escape the dangers it refuses to see."

Mr. Petre has enriched his book with some admirable maps and plans, while he has not, as is far too often the case, committed the mistake of overburdening his volume with a mass of notes and references.

The Waterloo Campaign, 1815. By J. H. Anderson. London: Hugh Rees, Ltd., 1907.

This book does not profess to be anything more than the merest sketch of the campaign of 1815, but it is very clear and appears to be intended to be read in combination with General Robinson's book on Waterloo, to

the maps in which attention is invited in the absence of maps in Mr. Anderson's own work. The author finds some reason for Napoleon's want of success in his attacks on Wellington's position in the manner in which the position was occupied and the way his attacks were met, added to the disquieting approach of the Prussians on his right—that in fact "Napoleon was beaten because he had met tactics for which he was unprepared." Perhaps the most useful part of this book to those officers who use it for purposes of examination will be found in the chapter containing the "General Comments" and the questions at the end of the book, which in themselves very fairly indicate the main features with which the student—and especially the examination student—should seek to make himself acquainted. To this large class Mr. Anderson's book should be of much assistance.

PRINCIPAL ADDITIONS TO LIBRARY, AUGUST, 1907.

Great Japan—A Study in National Efficiency. By ALFRED STEAD. 8vo. (John Lane.) London, 1906.

Reglement de Manœuvre de l'Artillerie à Pied Artillerie de Siège et Place—Instruction sur le Tir. Ministère de la Guerre. Crown 8vo. 1s. 2d. (Charles Lavauzelle.) Paris, 1904.

Reglement de Manœuvre de l'Artillerie de Campagne. Ministère de la Guerre. 2 vols. 12mo. 3s. (R. Chapelot et Cie.) Paris, 1906.

Sondervorschriften für die Fussartiheree. 12mo. 10d. (E. S. Mittler und Sohn.) Berlin, 1907.

Manual for Mounted Riflemen, Cape Colonial Forces, 1906. Official. 12mo. Cape Town, 1906.

Japan—An Interpretation. By LAFCADIO HEARN. 8vo. 8s. 6d. (The Macmillan Company.) London, 1906.

The American Commonwealth. By JAMES BRYCE. 2 vols. 8vo. 12s. 6d. (The Macmillan Company.) London, 1907.

The Battlefields of Germany. By Colonel G. B. MALLESON. 8vo. (W. H. Allen & Co.) London, 1884.

Presentation of Colours to the First Battalion Coldstream Guards by His Majesty the King at Buckingham Palace, 29th May, 1907. 8vo. (Presented.) n.p., n.d.

Waterloo Lectures. By Colonel C. C. CHESNEY. 4th Edition. 8vo. 6s. (Longmans, Green & Co.) London, 1907.

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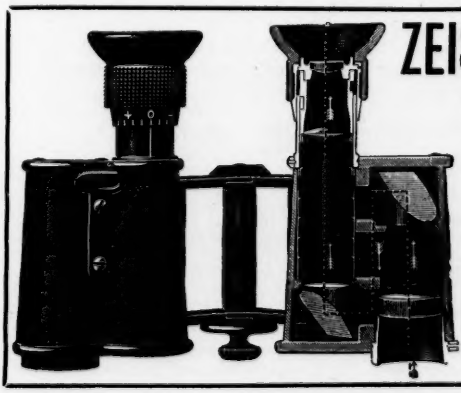

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